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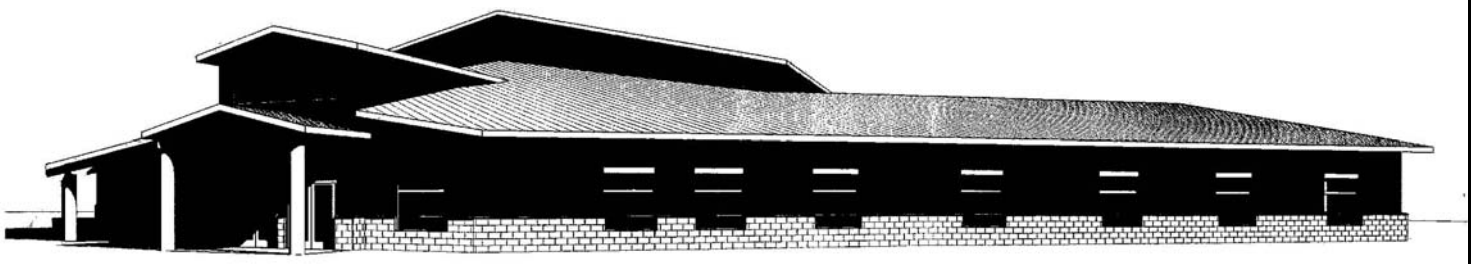
ENVIRONMENTAL ASSESSMENT FOR THE CONSTRUCTION OF A COMMUNITY ACTIVITIES CENTER



MALMSTROM AIR FORCE BASE, MONTANA

NZAS 01-3003A

Prepared for:

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Your comments on this Draft Environmental Assessment (EA) are requested. Letters or other written or oral comments provided may be published in the Final EA. As required by law, comments will be addressed in the Final EA and made available to the public. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the Final EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of the Final EA. However, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the Final EA.

Contents, Continued

Contents, Continued

Contents, Continued

Contents, Continued

Page

Appendices

Tables

Figures
(Figures appear at the end of the section in which they are first referenced.)

SECTION 1.0

Purpose of and Need for the Proposed Action

1.1 Executive Summary

This environmental assessment (EA) was developed for the proposed construction of a community activity center (CAC) at Malmstrom Air Force Base (AFB or Base). A properly sized and configured CAC is critical to unit-cohesiveness and thus would enhance the ability of Malmstrom AFB to meet its mission. This EA discusses the potential effects of four alternatives for construction and operation of the CAC proposed to be built at Malmstrom AFB and the No Action alternative. This EA concludes that the Preferred Alternative is Alternative 2, Construct CAC at Site 1, including Low-impact Development (LID) for stormwater management. Low Impact Development could consist of construction that incorporates detention basins, rain gardens, dispersion beds, bio-swales, or a combination of these as determined to be effective under final design. Malmstrom AFB is not isolated; however, its northern tier location, with long, dark winters and limited small-town social life, necessitates a facility to accommodate intensive on-base community activities. Functional layout, appearance, and adequate space to accommodate mission-essential and community activities and equipment are fundamental for a high quality CAC.

The existing Club, in Building 1600, is located on 4th Avenue North, between 70th Street North and 72nd Street North. It was constructed in 1966 and is jointly used by enlisted personnel and officers. The Club does not adequately satisfy mission–essential and community activity demands. The Club's size and configuration provide marginal accommodation for mission-essential meetings (e.g., Commander's calls), other non-seated functions (e.g., town meetings), or large social functions. Large gatherings currently are held in a former hangar or at off Base rented facilities. In addition, because of its marginal capacity, maintenance issues, and the antiquated design of the existing grease trap system, the current club must be replaced. Asbestos was used in the construction of the Club and lead-based paint is likely present. Remediation of these materials is not part of the proposed project, although through demolition of the existing club, these concerns will be addressed. Additionally, the Club does not have an interior sprinkler system and; therefore, does not comply with fire regulations.

This EA discusses in detail the potential effects of construction and operation of the proposed CAC to be built under the following alternatives:

- Alternative 1 – Construct the CAC at Site 1.
- Alternative 2 (Preferred) – Construct the CAC at Site 1, including construction of a LID consisting of grading/land shaping to enhance overland flow and infiltration, landscaping areas to slow the rate of discharge from impervious areas, collecting and conveying stormwater to prevent erosion and sedimentation, or constructing bio-retention cells to control the discharge of stormwater and aid in water quality treatment. The goal at the site is to provide retention of stormwater discharges generated by all storms up to and including the 2, 5 and 10-year, 2- and 24-hour storm events with no

increase in stormwater discharge from the site over that of current conditions up to the 10-year events.

- Alternative 3 – Construct the CAC at Site 2.
- Alternative 4 – Construct the CAC at Site 2, including LID as described for Alternative 2 above. However, due to the limited area of Site 2, construction of the LID would be smaller and capable of capturing and retaining only about 80 percent of stormwater generated at the site from a 2-year, 24-hour storm event.

The EA discusses the potential effects of the proposed project on air resources, water resources, geological resources, biological resources, cultural resources, noise, health, safety and waste management, land use, socioeconomics and environmental justice, and utilities. Evaluation of impacts to stormwater and potentially associated erosion are of particular concern in the construction of this project.

The EA concludes that the two Alternatives incorporating LID (Alternatives 2 and 4) would result in no significant impacts to the human environment. The EA concludes that the two alternatives lacking LID (Alternatives 1 and 3), would adversely affect the human environment as it pertains to stormwater runoff. With the assistance of Booz Allen Hamilton, Malmstrom AFB was provided with a comprehensive watershed analysis of the Whitmore Ravine drainage area. This analysis, dated March 2008, provided detailed insight into the likely causes of erosion to Whitmore Ravine and the corresponding sedimentation occurring in the Missouri River at the mouth of Whitmore Ravine. In an effort to meet the purpose and need of the project while minimizing to the maximum extent any increase erosion and sedimentation, Malmstrom AFB identified Alternative 2 as the Preferred Alternative. This site was chosen because Site 1 is a larger parcel than Site 2 and provides more area to accommodate LID.

1.2 Introduction

The U.S. Air Force (USAF or Air Force) 341 Civil Engineer Squadron (341 CES), proposes to construct and operate a new CAC and demolish the existing Club at Malmstrom AFB.

This EA meets the requirements of the National Environmental Policy Act (NEPA) and the implementing regulations. This EA was prepared to analyze potential environmental consequences associated with the following five alternatives:

- Alternative 1 – Construct the CAC at Site 1
- Alternative 2 (Preferred) – Construct the CAC at Site 1 including LID
- Alternative 3 – Construct the CAC at Site 2
- Alternative 4 – Construct the CAC at Site 2 including limited LID
- No Action Alternative

Section 1.3 provides background information on Malmstrom AFB. The purpose and need for the Proposed Action are discussed in Section 1.4. Detailed descriptions of Alternatives 1 through 4 and the No Action Alternative are provided in Section 2.0. Section 3.0 describes the existing conditions of various environmental resources at the proposed alternative locations. Section 4.0 describes how those environmental resources could be affected by

implementing the alternatives. Section 5.0 evaluates the cumulative effects of past, present, and future actions at Malmstrom AFB. Section 6.0 is a bibliography of resources cited in the preparation of this EA. Figures are provided at the end of each section in which they are referenced and appendices are provided at the end of the document. Appendix A provides copies of agency coordination letters, Appendix B provides photographic documentation, Appendix C contains the list of acronyms and abbreviations used in this EA, and Appendix D contains a copy of the Draft Final Whitmore Ravine Watershed Assessment for the Upper Missouri Dearborn Rivers Sub-Basin, Sun-Unit 686.

1.3 Background

Malmstrom AFB encompasses over 3,400 acres of land in Cascade County in north central Montana (see Figure 1-1). The Base lies approximately 0.3 miles east of the City of Great Falls city limit at its closest point and is five miles from the central business district. Interstate 15 (I-15) passes along the western boundary of Great Falls. Access to the Base main gate is off U.S. Highway 87/89, east of I-15, via 2nd Avenue North.

A CAC would promote a broad spectrum of opportunities that support the mission and improve the quality-of-life at Malmstrom AFB. The CAC would provide recreational activities that develop esprit de corps, promote family well-being, and enhance mental and physical fitness. The CAC would be a general-purpose facility that provides activities and services, such as holiday and special events, cultural programs, and programs and services for specific groups such as clubs, families, and Base units. Airmen and their families who are involved in organizations, off-duty education, and career training programs could use a conference room or technology center as an alternate venue to supplement mission essential functions that exceed the classroom capacity of the existing education center. Additionally, it is a place where airmen and their families could host small and large gatherings, a necessary requirement to improve the quality of life on the Base. The CAC would provide a permanent location for family and community support functions. The existing Club and alternative site locations are shown on Figure 1-2.

Alternative 1 consists of constructing and operating a new CAC at Site 1 and the eventual demolition of the existing Club (see Section 2.2.1). Site 1 is located approximately 0.7 miles east of the main gate to Malmstrom AFB, west of the intersection of Goddard Drive and 72nd Street North. The CAC would be constructed at Site 1 prior to demolition of the Club, which is located along 4th Avenue North between 70th Street North and 72nd Street North (see Figure 1-2).

Alternative 2 (Preferred) consists of constructing and operating a new CAC at Site 1, the eventual demolition of the existing Club (see Section 2.2.1), and the addition of LID stormwater management. The LID would consist of construction of detention basins, landscaping, rain gardens, dispersion beds, bio-swales, or a combination of these as determined to be effective under final design. The design of the stormwater collection system shall be in accordance with Army TM 5-820-4/Air Force AFM 88-5, Chapter 4, Drainage and Section 01360: Environmental Protection for areas other than airfields and the UFC 3-210-10 Low Impact Development Manual with specific design parameters developed from the City of Great Falls Storm Drainage Design Manual and EPA's International Stormwater BMP database. The LID would be designed to capture and retain stormwater

generated by all storms up to and including the 2, 5 and 10-year, 2- and 24-hour storm events with no increase in stormwater discharge from the site over that of current conditions up to the 10-year events. The CAC would be constructed at Site 1 prior to demolition of the existing Club.

Alternative 3 consists of constructing and operating a new CAC at Site 2 and the eventual demolition of the existing Club (see Section 2.2.1). Site 2 is located approximately 1.0 miles east of the main gate to Malmstrom AFB, east of the intersection of 4th Avenue North and 74th Street North. The CAC would be constructed at Site 2 prior to demolition of the Club.

Alternative 4 consists of constructing and operating a new CAC at Site 2, with the eventual demolition of the existing Club (see Section 2.2.1), and the development of LID similar to that mentioned in Alternative 2. However, due to the limited area of Site 2, the LID would be smaller in size and capable of retaining only 80 percent of the stormwater generated from a 2-year, 2-hour storm event. The CAC would be constructed at Site 2 prior to demolition of the existing Club.

1.4 Project Need and Purpose

The existing Club does not currently meet the following functional or regulatory requirements:

- The Club is too small to accommodate personnel for mission-essential meetings (e.g., Commander Calls) or to accommodate personnel, dependents, and others for non-seated functions (e.g., town meetings), or large gatherings. Some of these meetings have been discontinued, are not held as often, are held in an old hangar, or are held off-base at rented facilities.

- The grease trap in the kitchen of the Club is not working correctly due to marginal capacity, maintenance issues and its antiquated design. Oil and grease disposal at the Club results in the clogging of drains and pipes. Both constituents are occasionally observed in sanitary manholes.

- The Club does not have an interior sprinkler system and, therefore, is not in compliance with fire regulations for public assembly facilities.

- The Club was constructed in 1966 and has been remodeled and upgraded periodically since then. The building still does not meet current Air Force standards; and does not comply with current building codes and force protection requirements.

- Upgrading the Club would exceed 70 percent of the estimated replacement cost of a new facility. Air Force regulations mandate new construction when renovation costs exceed 70 percent of new construction.

Alternatives 1 through 4 would replace the existing substandard Club with a state-of-the art CAC that meets current Air Force standards.

1.5 Scope of the Environmental Review

Malmstrom AFB prepared this EA in accordance with the National Environmental Policy Act, the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500-1508), and 32 CFR 989 (National Defense Environmental Impact Analysis Process). As allowed by 40 CFR 1500.4 and 1508.9 and 32 CFR 989, this EA focuses on specific issues and concerns affecting Malmstrom AFB.

1.6 Other Applicable Regulatory Requirements

Each environmental resource is regulated or protected by federal and state regulations. In establishing the background conditions and assessing the potential environmental consequences of the Proposed Action, the following regulations were considered.

1.6.1 Air Quality

The Montana Clean Air Act (CAA) (Montana Code Annotated, Title 75, Chapter 2 [MCA 75.02]) implements the federal CAA. The Montana CAA, implemented by MCA and Administrative Rules of Montana (ARM), establishes ambient air quality standards (AAQS), permitting, and monitoring procedures. Montana law and regulations implement and in many cases adopt by reference the federal CAA Amendments of 1990, which is the current federal legislation regulating the prevention and control of air pollution.

1.6.2 Water Quality

The Water Pollution Control Law (MCA 75.05) sets forth water conservation, water quality protection, and pollution prevention and abatement measures. Implementing regulations include the Water Pollution Administrative Regulations (ARM, Title 17, Chapter 30 [ARM 17.30]). The Montana Pollutant Discharge Elimination System (MPDES) Rules (ARM 17.30.12-13) establish effluent limitations, treatment standards, and other requirements for point source discharge of waste into state waters, including storm water runoff. The Groundwater Pollution Control Regulations (ARM 17.30.10) establish groundwater classifications and set forth protection and permitting requirements. The Surface Water Quality Standards (ARM 17.30.06) establish surface water quality criteria to ensure public health and safety and provide for water conservation.

The MDEQ issued Malmstrom AFB an authorization for coverage under a General Permit for Storm Water Discharges Associated with Industrial Activity. The permit became effective on October 1, 2006 and expires on September 30, 2011.

The permit authorizes Malmstrom AFB to discharge stormwater in accordance with parameters specified in the permit. The permit effluent limitations include no discharge of process wastewater pollutants to surface waters. Stormwater discharge may only be generated through rainfall precipitation and snowmelt. No discharge associated with industrial activity may violate water quality standards, and new or increased storm water discharges associated with industrial activity shall not cause degradation as described by ARM 17.30.715(3) and MCA 75-5-301(5)(c). The permit requires Malmstrom AFB to implement and maintain a storm water pollution prevention plan.

Malmstrom AFB holds a permit to discharge wastewater to the wastewater treatment facility owned and operated by the City of Great Falls. The permit is titled "City of Great Falls Permit to Discharge Industrial Wastewater," does not have a permit number, and is valid until 31 December 2009.

1.6.3 Public Health and Safety and Hazardous Waste

The Solid Waste and Litter Control Act (MCA 75.10) provides for a state solid waste management and a resource recovery plan. All solid waste disposal must comply with this Act and 40 CFR 240-259. Municipal solid waste landfills must comply with 40 CFR 258, "Criteria for Municipal Sold Waste Landfills." Air Force installations must use permitted, secure, municipal or regional facilities for solid waste disposal, when feasible. In addition, Malmstrom AFB must comply with the requirements of Department of Defense (DoD) directive 4165.60 when disposing of solid waste.

The Montana Integrated Waste Management Act (MCA 75.10.08) provides for waste reduction and recycling programs. The Air Force prefers recycling and diversion to ultimate disposal. Air Force Instruction 32-7080 Pollution Prevention Program sets forth policy encouraging these alternatives. Contract specifications for the Proposed Action would require consideration of recycled materials and encourage the diversion and reuse of construction debris.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980 (42 United States Code [USC] 103). This law created a tax on the chemical and petroleum industries and provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. Over 5 years, $1.6 billion was collected and the tax went to a trust fund for cleaning up abandoned or uncontrolled hazardous waste sites. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at these sites, and established a trust fund to provide for cleanup when no responsible party could be identified (U.S. Environmental Protection Agency [EPA], 2006a).

The law authorizes two kinds of response actions: (1) short-term removals, where actions may be taken to address releases or threatened releases requiring prompt response and (2) long-term remedial response actions that permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious but not immediately life threatening. These actions can be conducted only at sites listed on the EPA National Priorities List (NPL) (EPA, 2006a).

CERCLA also enabled the revision of the National Contingency Plan (NCP). The NCP provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the NPL (EPA, 2006a).

The Superfund Amendments and Reauthorization Act (SARA) amended CERCLA on October 17, 1986 (42 USC 103). SARA reflected EPA's experience in administering the complex Superfund program during its first 6 years and made several important changes and additions to the program. SARA stressed the importance of permanent remedies and

innovative treatment technologies in cleaning up hazardous waste sites. It also required Superfund remedies to consider the standards and requirements found in other state and federal environmental laws and regulations. In addition, SARA provided new enforcement authorities and settlement tools; increased state involvement in every phase of the Superfund program; increased the focus on human health problems posed by hazardous waste sites; encouraged greater citizen participation in making decisions on how sites should be cleaned up; and increased the trust fund to $8.5 billion (EPA, 2006b).

The Montana Hazardous Waste Act (MCA 75.10.04), and the Hazardous Waste Management Regulations (ARM 16.44) control the generation, storage, transportation, treatment, and disposal of hazardous wastes. The act authorizes the state to implement a program pursuant to the federal Resource Conservation and Recovery Act (RCRA).

The Refuse Disposal Regulations (ARM 16.14.05) implement the Hazardous Waste Act. The regulations provide uniform standards for the storage, treatment, recycling, recovery, and disposal of solid waste, including hazardous waste, and the transportation of hazardous waste.

1.6.4 Biological Resources

The Endangered Species Act (16 USC 1531-1544) requires federal agencies to avoid jeopardizing the continued existence of endangered or threatened species and avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on endangered or threatened species of fish, wildlife, and plants and their critical habitats and take steps to conserve and protect these species. The act requires the avoidance or mitigation of all potentially adverse impacts to endangered and threatened species.

Executive Order (EO) 11990, "Protection of Wetlands," requires federal agencies to take action to avoid, to the extent practicable, the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. The intent of EO 11990 is to avoid direct or indirect effects of construction in wetlands if a feasible alternative is available. All federal and federally supported activities and projects must comply with EO 11990. In addition, activities occurring in jurisdictional wetlands and other Waters of the United States require compliance with Section 404 of the Clean Water Act (administered by the U.S. Army Corps of Engineers) and Section 401 of the Clean Water Act (administered by EPA) for on-Base lands and the MDEQ for off-Base lands).

EO 11988, "Flood Plain Management, "requires federal agencies to avoid, to the extent possible, long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development when there is a practicable alternative. In accomplishing this objective, "each agency shall provide leadership and shall take action to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by flood plains in carrying out its responsibilities." This applies to the following actions: (1) acquiring, managing, and disposing of federal lands and facilities, (2) providing federally undertaken, financed, or assisted construction and improvements, and (3) conducting federal activities and programs affecting land use,

including but not limited to water and related land resources planning, regulation, and licensing activities.

1.6.5 Cultural, Paleontological, and Architectural Resources

The primary goal of the National Historic Preservation Act (NHPA) of 1966 (16 USC 470 et seq., as amended) is to ensure adequate consideration of valuable historical properties, when performing federal activities. The NHPA seeks to identify and mitigate impacts to significant historical properties. The NHPA is the principal authority protecting historical properties. Federal agencies must determine the effect of their actions on cultural resources and take steps to ensure that all resources are located, identified, evaluated, and protected. 36 CFR 800 defines the responsibilities of the state, the federal government, and the Advisory Council on Historic Preservation in protecting historical properties identified in a project area. Section 106 of NHPA and its implementing regulations mandate the identification of cultural resources that would be potentially affected by project activities and that the Air Force address the effects of the undertaking on such resources. 36 CFR 60 establishes the National Register of Historic Places (NRHP) and defines the criteria for evaluating eligibility of cultural resources to the NRHP.

The Archaeological Resources Protection Act of 1979 (16 USC 470 aa-470 mm, as amended) protects archaeological resources on federal lands. If an agency discovers archaeological resources during site activities, the act requires permits for excavating and removal of any archaeological resources.

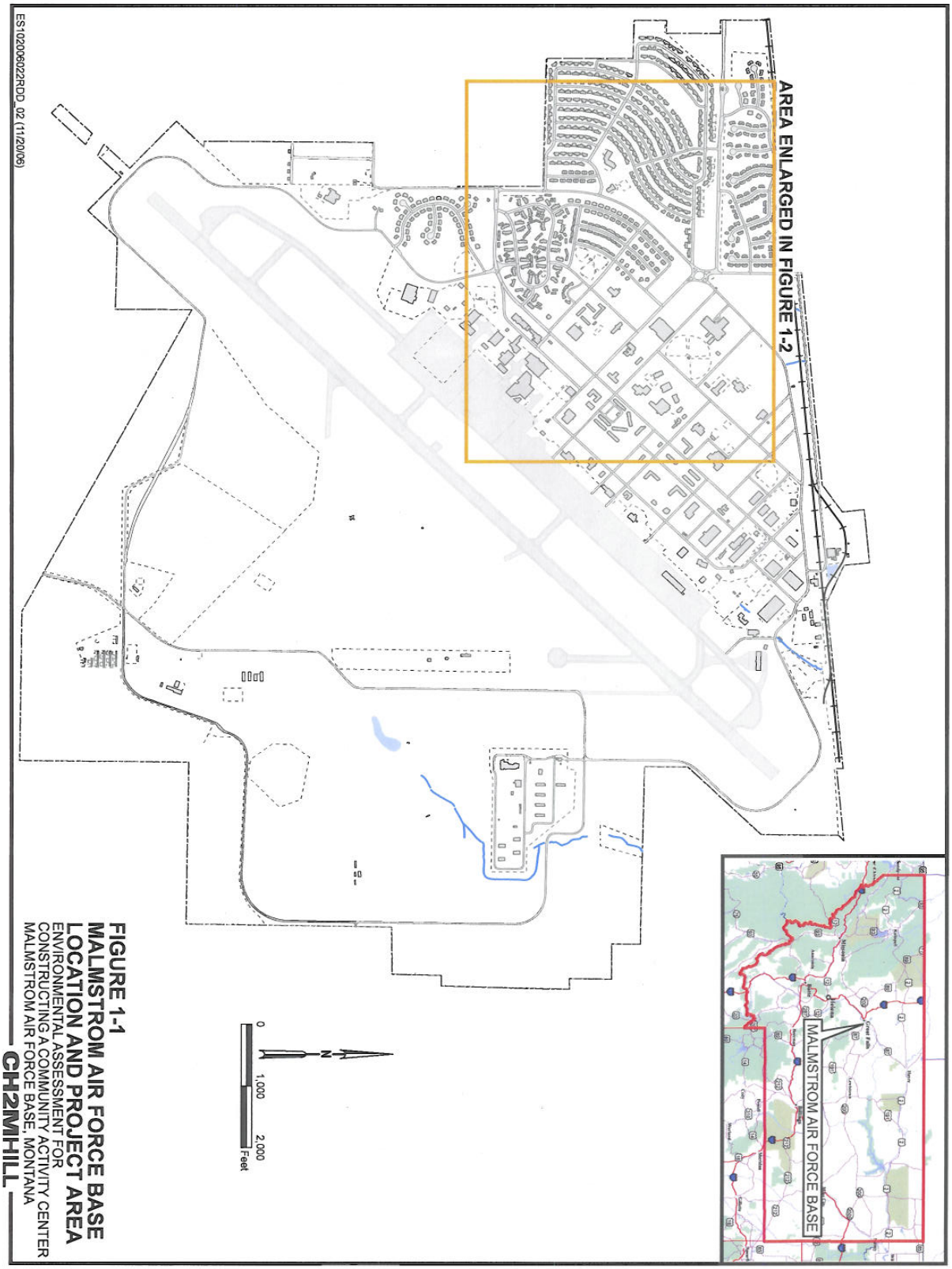
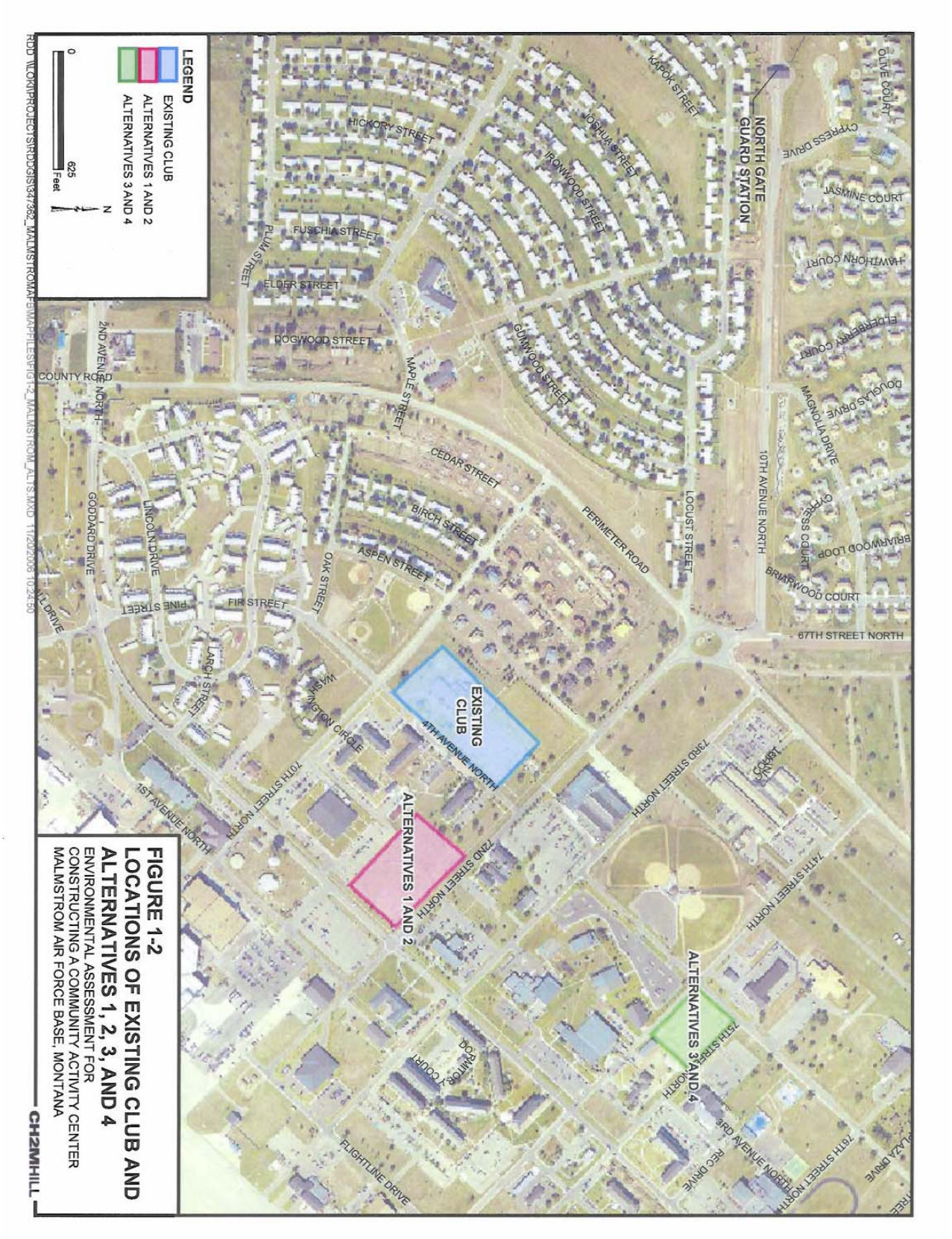


Figure 1-1 Malmstrom Air Force Base Location, and Project Area



306
307 Figure 1-2 Locations of Existing Club, Alternatives 1, 2, 3, and 4

Section 2.0

Alternatives Analysis

This section provides a brief summary of the other alternatives analyzed and the reasons for their rejection. This section also describes and compares the elements of Alternatives 1 through 4 and the No Action Alternative.

2.1 Other Alternatives Analyzed and Rejected

The Air Force evaluated an alternative to upgrade the existing Club. Air Force guidance mandates replacement of facilities if the cost of renovation exceeds 70 percent of the replacement cost (USAF, 1995a). The renovation option was considered but rejected because the estimated project cost of the renovation exceeded the 70 percent threshold due to multiple building code deficiencies including fire, waste disposal issues (i.e., grease trap), and the presence or potential presence of multiple sources of hazardous materials (i.e., lead-based paint and asbestos). These issues will be addressed during demolition of the existing club. The existing Club does not meet current Air Force design standards, nor does it comply with current building codes and Air Force protection requirements. Because renovation of the existing Club would not comply with Air Force requirements for funding, it was eliminated from consideration; renovation of the existing Club is not analyzed further in this EA.

2.2 Alternative 1 – Construct CAC at Site 1

Alternative 1 consists of constructing and operating a new CAC at Site 1 and demolishing the existing Club. Figure 1-2 shows the location of Site 1. The CAC would be constructed prior to demolition of the Club.

Air Force space allowances for CAC's for 2,001 to 4,000 people are designed at 19,800 square feet (ft^2) (approximately 1,840 square meters [m^2]) (AFH 32-1084). The calculated need for Malmstrom AFB is 3,563 people. Table 2-1 lists the functional breakout of the proposed type of space at the CAC as described in the Malmstrom AFB Fiscal Year (FY) 2004 Military Construction Project Data for Construct CAC Project (Malmstrom AFB, 2002c). The total facility area, including the associated parking lot, is 82,208 ft^2 (1.89 acres).

The proposed CAC would include a large meeting room. Facilities that could be incorporated into the CAC include a multi-purpose room, recreation room, music room, technology room, conference room, restrooms, administration room, information technology room, caterer's kitchen (with oven, stove, sink, and grease trap), electrical/mechanical room (with furnace and hot/cold water, and electrical and gas connections), and storage rooms.

TABLE 2-1
Proposed CAC Space Allocation
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Type of Space	Approximate m^2 (ft^2)
Entry Vestibule, Telephone, Vending	28 (300)
Lobby	82 (880)
Coatroom	20 (220)
Men's Restroom	66 (700)
Women's Restroom	99 (1,070)
Administration Offices	42 (450)
Manager's Office	16 (170)
Locker Room	16 (170)
Administration Storage	4 (40)
Recreation Room	233 (2,500)
Caterer's Kitchen	166 (1,790)
Multipurpose Room (600 persons)	792 (8,530)
Multipurpose Room Storage	66 (710)
Conference Room	33 (360)
Music Room	33 (360)
ITT Area	17 (180)
Technology Center	30 (320)
Miscellaneous Storage	19 (200)
Janitor Closet	4 (40)
Electrical/Mechanical Room	74 (800)
Total Facility	1,840 (19,800)
Estimated Size of Parking Area	5,800 (62,408)
Total Estimated Facility with Parking Area	7,640 (82,208)

Notes:
m^2 = square meters
ft^2 = square feet

The Air Force seeks to minimize or eliminate interruption to Malmstrom AFB personnel and the Base community. All existing utilities are underground, including electrical; fire protection; natural gas; water; sewer; telephone; and cable television. Telephone and electrical services, originally installed above ground, were buried during one of many interim renovations of the on Base utility systems. Depending upon the heating, ventilation, and air conditioning (HVAC) system selected, a building connection to the high temperature hot water system might be required. Standard construction practices for locating buried utilities

would be implemented prior to ground-disturbing activities to avoid or minimize impacts to buried utilities at Site 1.

Under Alternative 1, vehicle access to the CAC would be co-located with that of existing Building number 145 to avoid interference with traffic at the intersection of Goddard Drive and 72nd Street North, the only signalized intersection on Base.

2.2.1 Demolition

To accommodate ongoing administrative and social activities and to prevent adverse impacts to the Malmstrom AFB community, the Base proposes to demolish the Club after all activities have moved into the new CAC. Due to a lack of funding, the demolition of the existing Club might be delayed by five years or more. The Club would continue to be used for dining and small meetings until demolished. The Base will continue to review its long-term land use plans to determine when demolition of the existing Club best meets Base needs, and will seek opportunities to demolish other outdated structures , decrease impervious surfaces and, consequently, decrease stormwater runoff.

2.2.2 Construction

Construction of a proposed CAC would comply with current building codes. Specific replacement and upgrades to the utilities include the following:

- New natural gas valves would be installed where necessary to connect the existing gas main to the new CAC.
- New sanitary sewer and drinking water line connections would be installed where necessary to connect the existing sewer and water lines to the new CAC.
- New electrical circuits and supporting infrastructure would be provided as needed to connect to the CAC without disrupting services to existing facilities.
- A connection to the high temperature hot water system may be required, depending upon the HVAC system selected.

Standard construction practices for locating buried utilities would be implemented prior to ground-disturbing activities to avoid or minimize impacts to buried utilities during construction.

2.3 Alternative 2 (Preferred) – Construct CAC at Site 1 Including LID

Demolition of the existing Club, and construction and operation of the CAC for Alternative 2 would be as described under Alternative 1. Additionally, LID stormwater management features would be incorporated into the site design under this alternative to maintain or restore natural hydrologic functions of the site and control stormwater runoff to the extent possible. The LID would consist of construction of a detention basin, landscaping, rain gardens, dispersion beds, bio-swales, or a combination of these as determined to be effective under final design. The design of the stormwater collection system shall be in accordance with Army TM 5-820-4/Air Force AFM 88-5, Chapter 4, Drainage and Section 01360:

Environmental Protection for areas other than airfields and the UFC 3-210-10 Low Impact Development Manual with specific design parameters developed from the City of Great Falls Storm Drainage Design Manual and EPA's International Stormwater BMP database. The LID would be designed to capture and retain stormwater generated by all storms up to and including the 2, 5 and 10-year, 2- and 24-hour storm events and result in beneficial affects to stormwater discharge from the site over that of current conditions.

2.4 Alternative 3 – Construct CAC at Site 2

Alternative 3 consists of constructing and operating a new CAC at Site 2 and demolishing the existing Club. The location of Site 2 is shown on Figure 1-2. The CAC would be constructed prior to demolition of the Club.

Demolition of the Club, and construction and operation of the CAC under Alternative 3 would be as described for Alternative 1. However, under Alternative 3, vehicle access to the CAC would be relocated to avoid interference with traffic at the intersection of 74th Street North and 4th Avenue North.

2.5 Alternative 4 – Construct CAC at Site 2 Including LID

Demolition of the existing Club, and construction and operation of the CAC under Alternative 4 would be as described under Alternative 1. Additionally, LID would be incorporated into site design under this alternative to control stormwater runoff. The LID would consist of smaller bio-retention or other means that would capture and retain only 80 percent of stormwater generated at the site during a 2-year, 24-hour storm event. The limited LID would be constructed at this site due to the smaller size of the site, compared to Site 1.

2.6 No Action Alternative

A CAC would not be constructed under the No Action Alternative. As previously described, the Club was constructed in 1966 and does not adequately satisfy mission-essential or community activity demands. Existing sites on-Base do not meet the needs of the programs that the Malmstrom AFB Community Support and Services Squadron attempts to provide to military families. Currently, the community support functions are held at various on-Base locations on a space-available basis or are held at rented off-Base venues because mission-related activities have priority. The lack of dedicated space for community activity functions limits or cancels community activities. Every year, at least 10 percent of the current community activity functions are cancelled or discontinued and functions are often held at inadequate facilities. Traditional community activity functions on Malmstrom AFB that are discontinued often cannot be revived because of the lack of facilities.

To meet the demand, Base and unit organizations use downtown Great Falls venues that are costly. Base community members need a place to relax, participate in various scheduled community activities, and use a technology center to further their education and careers. The quality of life at Malmstrom AFB is steadily declining due to this situation.

2.7 Comparison of Alternatives

Table 2-2 summarizes the potential environmental impacts of Alternatives 1 through 4, and the No Action Alternative based on the results of impact analyses presented in Section 4.0.

TABLE 2-2
Summary of Potential Environmental Impacts
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Resource Areas	Alternative 1 - CAC at Site 1	Alternative 2 (Preferred) - CAC at Site 1 including LID	Alternative 3 - CAC at Site 2	Alternative 4 - CAC at Site 2 including LID	No Action Alternative
Air Resources	–	–	–	–	0
Water Resources (groundwater, surface water, and stormwater)	–	+	–	+	0
Geological Resources (soils and geological hazards)	–	–	–	–	0
Biological Resources (vegetation, wetlands, floodplains, and wildlife)	0	0	0	0	0
Cultural Resources (archaeological and historical setting)	0	0	0	0	0
Noise	–	–	–	–	0
Health and Safety (public health management, worker safety and health, solid and hazardous waste management, sewage and stormwater waste management, environmental remediation activities, pesticides, and harmful substances)	–	–	–	–	–
Land Use, Transportation, and Visual Resources	–	–	–	–	0
Socioeconomics and Environmental Justice (definition of the resource, population and employment, environmental justice, and protection of children)	+	+	+	+	–
Utilities	–	–	–	–	0

Notes:

– = Potentially adverse, but no significant short-term or long-term impact

+ = Potentially positive/beneficial short-term or long-term impact

0 = No change

SECTION 3.0

Affected Environment

This section describes the existing conditions of various environmental resources at the two proposed alternative locations (Site 1 and Site 2) at Malmstrom AFB, and presents specific information about resources at Malmstrom AFB that could be adversely affected as a result of implementing the alternatives. This section is based on descriptions provided in the *Final Environmental Assessment for Phase 6 and Phase 7 Replace Family Housing at Malmstrom Air Force Base, Montana* (USAF, 2005), and the *Final Environmental Assessment for Construct Physical Fitness Center, Malmstrom Air Force Base, Montana* (USAF, 2006), unless otherwise noted through specific reference.

3.1 Air Resources

The air resources section describes the existing concentrations of various pollutants and the climatic and meteorological conditions that influence the quality of the air in the area around Malmstrom AFB. Precipitation, wind direction and speed, and atmospheric stability conditions are factors that determine the extent of pollutant dispersion. The type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences determine air quality. Comparing these values to federal or state Ambient Air Quality Standards (AAQS) determines the significance of a pollutant concentration in a region or geographical area.

EPA, under authority of the Clean Air Act (CAA), has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (NAAQS, represent the maximum allowable atmospheric concentrations and were developed for six criteria pollutants, including ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter less than 10 micrometers in diameter (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). Based on measured ambient criteria pollutant data, EPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (non-attainment). Non-attainment areas that achieve attainment are subsequently re-designated as maintenance areas for a period of 10 years or more. Areas are designated as unclassifiable for a pollutant when insufficient ambient air quality data is available for EPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment.

Under the CAA, state and local agencies may establish AAQS and regulations of their own, provided these are at least as stringent as the federal requirements. For selected criteria pollutants, the State of Montana has established its state AAQS, some of which are more stringent than the federal standards. Montana AAQS are more restrictive than federal standards for CO, NO_2, SO_2, and O_3. Montana does not have state standards for $PM_{2.5}$ (particulate matter less than 2.5 microns in diameter). In addition, Montana regulates emissions of settleable particulates (TSP), hydrogen sulfide (H_2S), fluoride in forage

(associated with toxicity to grazing cattle) and, visibility for which no federal standards exist (State of Montana, 1996). A summary of the federal and Montana AAQS that apply to the proposed project area is presented in Table 3-1.

TABLE 3-1
State of Montana and Federal Ambient Air Quality Standards
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

			Federal (NAAQS)	
Air Pollutant	**Averaging Time**	**Montana AAQS**	**Primary**	**Secondary**
CO	8 hours	9 ppm	9 ppm	---
	1 hour	23 ppm	35 ppm	---
NO_2	AAM	0.05 ppm	0.053 ppm	0.053 ppm
	1 hour	0.30 ppm	---	---
SO_2	AAM	0.02 ppm	0.03 ppm	---
	24 hours	0.10 ppm	0.14 ppm	---
	3 hours	---	---	0.50 ppm
	1 hour	0.50 ppm	---	---
PM_{10}	AAM	50 $\mu g/m^3$	---	---
	24 hours	150 $\mu g/m^3$	150 $\mu g/m^3$	---
$PM_{2.5}$	AAM	---	15 $\mu g/m^3$	15 $\mu g/m^3$
	24 hours	---	35 $\mu g/m^3$	
O_3	1 hour	0.10 ppm	0.12 ppm	0.12 ppm
	8 hours	---	0.08 ppm	0.08 ppm
Pb and Pb Compounds	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
TSP	30 day	10 gm/m^2	---	---
H_2S	1 hour	0.05 ppm	---	---
Fluoride in Forage	1-month	50 $\mu g/g$	---	---
	grazing season	35 $\mu g/g$	---	---
Visibility	AAM	3 x 10^{-5}/meters	---	---

Notes:

--- = no requirement
AAM = annual arithmetic mean;
ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

Sources: EPA, 2006c; State of Montana, 1996

Section 162 of the CAA further established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the prevention of significant deterioration (PSD) program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. Class II areas are those where moderate, well-controlled growth could be permitted. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have been designated. The PSD require-

ments affect construction of new major stationary sources in the PSD Class I, II, and III areas and are a pre-construction permitting system. There are no designated Class I areas in Cascade County (MDEQ, 2006).

3.1.1 Climatology and Meteorology

Malmstrom AFB, located in north central Montana, is on the dry, eastern side of the Rocky Mountains and has a modified semiarid, continental-type climate. Summertime is generally pleasant, with cool nights, moderately warm and sunny days, and very little hot, humid weather. Winters are milder than would be expected of a continental location at this latitude because of the frequent occurrence of warm downslope winds (Chinooks) that produce temperature changes of 40 degrees Fahrenheit (°F) or greater in 24 hours. July is generally the warmest month, with a mean daily high temperature of 84.4°F. January is usually the coldest month, with a mean daily low temperature of 14°F (Western Regional Climate Center, 2005). The growing season averages 135 days per year.

Humidity and precipitation are usually low, with associated large fluctuations in daily and seasonal temperatures. Average annual precipitation is 14.69 inches (Western Regional Climate Center, 2005). Most of the precipitation that occurs during the late fall, winter, and early spring falls as snow, but Chinook winds prevent large accumulations. The average annual snowfall is 43.6 inches (Western Regional Climate Center, 2005). The prevailing winds are from the southwest year-round and are generally moderate with speeds exceeding 25 mph only 2 percent of the time.

Based on the average annual precipitation records, the area would normally be classified as semi-arid, but about 70 percent of the annual rainfall typically occurs during the April to September growing season. The climate is favorable for dryland farming. Table 3-2 presents average monthly temperatures, precipitation, and snowfall from the nearest National Weather Service station in Great Falls, Montana.

TABLE 3-2
Climate Data for the City of Great Falls, Montana, 1893 to 2005
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Total Precipitation (inches)	Average Total Snowfall (inches)
January	34.0	14.0	0.60	7.7
February	35.8	14.5	0.58	6.7
March	44.3	22.0	0.94	8.6
April	57.8	33.2	1.07	3.4
May	66.8	41.4	2.31	0.8
June	74.4	48.8	3.10	0.0
July	84.4	54.5	1.47	0.0
August	82.4	52.2	1.15	0.0
September	70.9	43.4	1.36	0.9
October	60.3	36.1	0.81	2.0
November	45.5	25.8	0.67	6.4
December	36.8	18.8	0.62	7.0
Annual	57.8	33.7	14.69	43.6

TABLE 3-2
Climate Data for the City of Great Falls, Montana, 1893 to 2005
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Total Precipitation (inches)	Average Total Snowfall (inches)

Source: Western Regional Climate Center, 2005.

3.1.2 Air Quality

Malmstrom AFB is located in Cascade County. According to 40 CFR 81, Cascade County is located in the Great Falls Intrastate Air Quality Control Region (AQCR 141). The region is designated as in attainment, better than the national standards, or unclassified for CO, NO_2, SO_2, PM_{10}, O_3, and Pb. Cascade County is in attainment for ozone, NO_x, SO_2, and PM_{10}. Great Falls (Cascade County) is designated as a non-classified maintenance area for CO (EPA, 2006d). Monitoring data in Cascade County indicate generally good air quality.

According to MDEQ (MDEQ, 2006), the nearest PSD Class I area is the Lewis and Clark National Forest, located approximately 60 miles west of Malmstrom AFB. Scapegoat Wilderness, Helena National Forest, and Gates of the Mountain Wilderness are Class I areas that are not within 50 miles of the project area and Malmstrom AFB. The Flathead Indian Reservation, located approximately 120 miles west of Malmstrom AFB, is a nonmandatory Tribal Class I area, which requires similar protection as mandatory Class I areas.

Emissions at military installations generally include CO; volatile organic compounds (VOC); nitrogen oxides (NO_x), which are commonly measured as NO_2; sulfur oxides (SO_x), which are commonly measured as SO_2; and PM_{10}. Although O_3 is considered a criteria pollutant and is measurable in the atmosphere, it is not often considered a pollutant when reporting emissions from specific sources. O_3 is not typically emitted directly from most emissions sources; it is formed in the atmosphere from its precursors (NO_x and VOCs), which are directly emitted from various sources. Thus, NO_x and VOCs are commonly reported instead of O_3. Sources of pollutants include stationary sources (i.e., fossil fuel combustion and fuel or solvent evaporation), construction activities, and mobile sources.

3.2 Water Resources

The water resources section provides a description of the groundwater and surface water resources, and stormwater at Malmstrom AFB.

3.2.1 Groundwater

Groundwater resources exist on Malmstrom AFB, and occur primarily in deep, confined aquifers. The depth to these deep aquifers ranges between about 100 feet to 500 feet below ground surface (bgs) at the Base. Shallow groundwater (encountered from depths ranging from 3 feet to approximately 20 feet bgs) occurs locally as noncontiguous, unconfined, perched zones. On Malmstrom AFB, shallow groundwater flow generally discharges to surface water. The shallow groundwater is thought to be a result of both the area's geologic makeup (e.g., sand lenses) and possibly man-induced activities (e.g., trenching and filling). In addition, part of the base flow originates from subsurface drains along the flight line. The

flight line subsurface drainage system runs the length of the runway and continuously discharges groundwater to the storm drain system (the north end of the runway drains to Outfall 3 and the south end drains to Outfall 1). The deep confined aquifers in the area tend to flow northward; flow in the shallow, unconfined aquifers typically follows topographic gradients (USAF, 2001).

Potable groundwater is present at depths greater than 100 feet bgs. The deep Madison-Swift aquifer has the greatest potential for future groundwater development. Because of the limited supply of water and discontinuous nature of the shallow perched zones, they are unlikely to be used as a water source in the future. Due to the ample surface water supply and the depth of most of the aquifers, groundwater resources have not been developed on Base (USAF, 2001).

3.2.2 Surface Water

Malmstrom AFB lies on a plateau that covers an area of approximately 10 square miles and that drains northward toward the Missouri River through a series of ravines, including Whitmore Ravine. The Missouri River is located approximately 1 mile north of the Base, and flows north and northeast. The Missouri River serves as the principal source of potable water for Malmstrom AFB and the City of Great Falls (USAF, 2001).

Whitmore Ravine is a coulee (i.e., a deep steep-sided ravine formed by erosion during the rapid melting of glaciers at the end of the last ice age, and the continued erosion from surface runoff over the last 100 years) and accepts overland and stormwater flow from drop inlets and underground piping. Whitmore Ravine is susceptible to erosion during most storm events. The Draft Final Whitmore Ravine Watershed Assessment Upper Missouri Dearborn Rivers Sub-Basin, Sub-Unit 686 Study, conducted by Booz Allen Hamilton and dated March 2008, found that soil erosion and total suspended solids significantly increased as stormwater flowed through the ravine, even with as little as 0.11 inches of precipitation. The study further stated that because the ravine forks are in a vulnerable condition, even a small rain event (less than the 2-year/2-hour storm or less than 0.72 inches rainfall) will exacerbate the ravine erosion.

Stream valleys occur throughout the area surrounding Malmstrom AFB, but most of these valleys are dry. A few perennial streams occur in the vicinity of the Base, and generate low runoff volumes into the Missouri River. In Drainage Areas 1, 2, and 3, continuous surface water base flow occurs as a result of groundwater discharging to surface water. Additionally, due to the development of the land within Drainage Area 1, some ground and surface waters have been channeled and moved into different areas. Examples of these conveyances are storm water drains, utility corridors, and the impervious surfaces of buildings, parking lots, and roads that have altered local flows. Some pipes, corridors, and culverts run through the saturated surface deposits (either perched water or true water table) allowing groundwater to intrude and follow the same channels/storm sewer pipes as the surface water. Therefore, drainage areas that convey surface water from the western and middle regions of Malmstrom AFB to the outfalls may also be carrying surficial groundwater as evidenced by the dry weather flow. Surface water drainage in the vicinity of the project area occurs primarily through open storm ditches and in ephemeral streams and coulees (see Figure 3-1) (USAF, 2001). No perennial streams are located in Drainage Area 2.

3.2.3 Stormwater

Development on Malmstrom AFB has contributed to changes in the pre-development conditions of soils and hydrology along the plateau. The removal of native soils and the addition of impervious surfaces in the form of pavement and buildings altered the natural hydrologic response. At numerous sites, stormwater runs off impervious surfaces and reaches downstream receiving water bodies in larger volumes, at faster rates, and more frequently than under pre-development conditions. At Malmstrom AFB, native soils of lower permeability were replaced with soils with greater permeability (e.g., as part of landscaped areas), which allow greater infiltration, slow the runoff rates, and reduce the runoff volume. Additionally, detention basins and swales were constructed in some areas of the Base to temporarily retain stormwater, allow sedimentation of suspended particulates, and increase overall travel time. Consequently, the potential for erosion associated with rapid, high-volume runoff has been addressed in some areas.

The Whitmore Ravine watershed receives surface and ground water flow from Malmstrom AFB and outlying agricultural areas. Stormwater from Malmstrom AFB is captured and conveyed to the six (6) outfalls that drain into the West, Middle, and East Forks of Whitmore Ravine and then to the Missouri River (See Figure 3-1). The West Fork receives stormwater through storm drains located on Malmstrom AFB that flow by gravity to Outfalls 1 and 2. Similarly, the Middle Fork receives surface water from Outfalls 3 and 4, and the East Fork from Outfalls 5 and 6.

Malmstrom AFB covers approximately 3,400 acres and has an estimated 662 acres of impervious area. The Base is divided into nine drainage areas, that drain water at six discharge points (outfalls) (Malmstrom AFB, 2005a). Stormwater drainage occurs primarily through open storm ditches, swales, and underground pipes and discharge outfalls. Drainage Areas 1 through 6 drain northerly and exit the Base at six outfalls, flowing into the west, middle, and east forks of Whitmore Ravine. They eventually discharge into the Missouri River, approximately 1 mile north of the Base boundary. Drainage Areas 7, 8, and 9 do not have point discharge (Malmstrom AFB, 2005a). The locations of the Drainage Areas on Malmstrom AFB are shown on Figure 3-1. Stormwater discharge is regulated by Montana Pollution Discharge Elimination System (MPDES) permit authorizations from the Montana Department of Environmental Quality (MDEQ). Multiple sources contribute stormwater discharge to Whitmore Ravine, which discharges to the Missouri River. Development of Malmstrom AFB has resulted in year-round flow into Whitmore Ravine.

Site 1 and the existing Club are located within Drainage Area 1. Site 2 is located within Drainage Area 2. These two drainage areas are discussed further; Drainage Areas 3 through 9 are not affected by the proposed alternatives and, therefore, are not discussed further.

Drainage Area 1 collects runoff from the southwest end of the runway, sub-drains along the flightline, the south end of the aircraft-parking apron, most of the former aircraft maintenance shops and hangars, the south end of the petroleum storage and pumping facility, the truck and tractor maintenance garage, streets, and buildings, and the majority of base housing. Drainage Area 1 has a steady flow due to foundation drains and perched water tables. The area drains through a combination of underground concrete pipes, primarily in the former aircraft operations and maintenance and the family housing areas, curb gutters in streets and roadways, and unlined ditches adjacent to streets. Drainage from

the area is collected into concrete pipes before exiting the base through approximately 400 linear feet (lf) of concrete lined channel and approximately 350 lf of unlined channel which includes culverts under the railroad and under the heat plant access road. There is a detention basin approximately 1850 lf from the base boundary into which water is diverted from the collection pipes during storm events. The basin was designed and constructed to reduce stormwater runoff associated with peak flow events discharging from Drainage Area 1 to Whitmore Ravine.

Drainage Area 1 covers a total area of 655.5 acres and has approximately 249.1 acres of impervious surface, approximately 406.4 acres of pervious surface, and a runoff coefficient of 0.61 (Malmstrom AFB, 2005a).

Drainage Area 2 is bounded by 72nd Street North, Goddard Drive, and Perimeter Road. The drainage area collects stormwater runoff from the north-central portion of the Base. The drainage flows north until it discharges off Base into the east branch of the west fork of Whitmore Ravine near Walnut Street. The basin drains by a combination of underground concrete pipes, grass-lined ditches, and curb and gutters in streets and roadways. Above-ground curb, gutter and ditch flow comprise over 70 percent of the flow pathway. The underground flow is confined to the vehicle maintenance and storage facility area located in the northeast corner of the drainage. The outfall collection channel near Walnut Street is an unlined ditch that passes under a railroad track via two 36-inch-diameter concrete pipes and under the north boundary road via one 48-inch-diameter corrugated metal pipe. Drainage Area 2 discharges through Outfall 2 and combines with the flow from Drainage Area 1 in the west branch of Whitmore Ravine.

Drainage Area 2 covers a total area of 213.6 acres and has an approximately 76.6 acres of impervious surface, approximately 137 acres of pervious surface, and a runoff coefficient of 0.60 (Malmstrom AFB, 2005a).

3.3 Geological Resources

The geological resources section provides a description of the geological resources including geology, topography, geologic hazards, and soils.

Malmstrom AFB is located in a glaciated portion of the Missouri Plateau within the northern part of the Great Plains Province. The site is underlain by the Sweetgrass Arch, a bedrock structural feature extending northwest from the Little Belt Mountains (24 miles to the south), past the southwestern side of the Base, and into Alberta, Canada. Stratigraphic units important to the framework of the region surrounding Malmstrom AFB range in age from the Madison Limestone of the Mississippian period (360 million years before present) to the Eolian Sand of the Holocene (10,000 years before present). These units include sedimentary bedrock formations, unconsolidated glacial deposits, and windblown deposits (USAF, 2001).

The topography of Malmstrom AFB is characterized by gently sloping plains that have been dissected by numerous streams. The Base ranges in elevation from 3,400 to 3,500 feet mean sea level, with the lowest elevation located in the northeast and the highest in the southwest. The change in elevation across the Base occurs gradually over 2.3 miles, with an average slope of approximately 0.5 degrees. (USAF, 2001)

Geologic hazards in the vicinity of Great Falls include landslides, earthquakes, mass movements, and faulting. Minor highway damage has been caused by small landslides occurring in the area. Earthquakes centered over 150 miles away have been felt at Malmstrom AFB. These tremors are infrequent (fewer than one per year) and can cause minor damage (USAF, 2001). Historically, most of the strong earthquakes in Montana have occurred in the western one-third of the state (U.S. Geologic Survey, 2006), west of Malmstrom AFB.

In the vicinity of Malmstrom AFB, Quaternary glacial deposits overlie Early Cretaceous shale and sandstone formations. The modern soils of Malmstrom AFB have developed directly on these Quaternary deposits and consist primarily of Lawther silty clay (associated with the Pleistocene till) and Dooley sandy loam (associated with the Holocene eolian sand) (USAF, 2001).

Other soils series that occur on Malmstrom AFB include Acel, Gerber, Gerber-Lawther, Hillon, Lawther-Gerber, McKenzie and Virgelle. Sites 1 and 2, and the existing Club are located within the Dooley soil series. (Ecosystem Research Group, 2006).

The Dooley soils series is characterized by very deep, well-drained soils found on uplands and lacustrine areas with slopes of 0 to 15 percent. These soils formed in alluvium or eolian material, and are 20 to 40 inches deep over lacustrine deposits or glacial till. Dooley soils are well-drained, have slow runoff with moderate to low permeability in underlying lacustrine material or glacial till (Natural Resources Conservation Services, 2002). On Malmstrom AFB, runoff is slow and surface erosion is light, in conjunction with the level nature of the surface at the proposed project sites. The average slope is 0.5 degrees on Malmstrom AFB. Dooley soils have a moderate to high erosion hazard from wind (USAF, 2001).

3.4 Biological Resources

Biological resources include vegetation, wetlands, floodplains, and wildlife.

3.4.1 Vegetation, Wetlands, and Floodplains

Malmstrom AFB is located on flat to gently rolling terrain in the Shortgrass Prairie region (also known as the Great Plains and the High Plains) of the United States. The eastern boundary of this region is in the general vicinity of the 100th meridian, while the western boundary is located at the foot of the Rocky Mountains (USAF, 2001).

Most native vegetation within the boundaries of Malmstrom AFB has been altered or modified by developmental activities (e.g., plowing, planting, and mowing) and consequently replaced with exotic species. In the southeast portion of the Base, fields have been plowed and planted with introduced grasses such as crested wheatgrass (*Agropyron cristatum*), Kentucky bluegrass (*Poa pratensis*), and intermediate wheatgrass (*Agropyron intermedium*). Some noxious weed populations of spotted knapweed (*Centaurea maculosa)*, Canada thistle (*Cirsium arvense)*, and field bindweed (*Convolvolus arvensis)* are known to occur on the Base (USAF, 2001).

Malmstrom AFB is bordered on the north, east, and south sides by agricultural and pasture lands, with mixed commercial, industrial, residential, and open land uses to the west and northwest. Bird aircraft strike hazard requirements, and bare-ground requirements, have resulted in regular mowing of grasses on base, which has contributed to the present composition of vegetation found on Malmstrom AFB (USAF, 2001).

According to the Montana Natural Heritage Program (NHP, 2006), 20 vascular and non-vascular plant species of concern occur within various locations throughout Cascade County. No federally-listed threatened or endangered species or potential habitats have been identified on Malmstrom AFB (Malmstrom AFB, 2002a).

Wetland areas have been identified on Malmstrom AFB. These areas include natural wetlands, retained stormwater, and streambeds that flow only after heavy precipitation. The primary wetland systems found on Malmstrom AFB are shallow, standing water pond environments, or wetlands contained within a channel. The only significant aquatic area on the Base is Pow Wow Pond, a 1-acre impoundment located in the east-central portion of the Base (USAF, 2001).

Malmstrom Air Force Base was surveyed for wetlands in 2006 and a number of wetlands were identified on Base. The nearest of these sites to the existing Club and Site 1 is located approximately 2,500 feet to the north, adjacent to the Base boundary. The nearest identified wetland site to Alternative 2 is located approximately 1,500 feet to the northwest, adjacent to the northern Base boundary. See Figure 3-1 for wetland sites in the vicinity of the alternative project sites.

Malmstrom AFB is located on a high plateau approximately 1 mile south of the Missouri River and is approximately 100 feet above the 100-year floodplain of the river. Malmstrom AFB is thought to have no floodplain areas (USAF, 2001).

3.4.2 Wildlife

Wildlife habitat is limited in the project area by the relatively large portion of land used for buildings, runways, and other facilities. Open areas on Base typically support a variety of introduced grasses and many open areas have been leased for hay production. Bird species of greatest abundance include a variety of songbirds, shorebirds, raptors, and waterfowl. Common mammals include the white-tailed jackrabbit, badger, skunk, ground squirrels, and field mice. Transient use of the area by coyotes might occur. No native fish are located on Base; the only large aquatic habitat on Base, Pow Wow Pond, contains stocked rainbow trout (USAF 2001b).

Currently, the peregrine falcon (*Falco peregrinus*); bald eagle (*Haliaeetus leucocephalus*); and the Canada lynx (*Lynx canadensis*) are special-status wildlife species in Cascade County that are federally listed, delisted, or posted for delisting by the U.S. Fish and Wildlife Service (USFWS) (NHP, 2006). Habitat for these species is not present on Malmstrom AFB (USAF 2001). The ferruginous hawk (*Buteo regalis*) and the logger head shrike (*Lanius ludovicianus*), species identified as protected by the Montana Department of Fish, Wildlife and Parks, might migrate into or across Malmstrom AFB (Malmstrom AFB, 2002a).

In 1994, a biological survey of Malmstrom AFB was conducted for the presence of threatened and endangered species and the potential for their habitat on Base. No

threatened or endangered species, nor their habitat, were identified during the survey. In October 2001, Malmstrom AFB requested and received confirmation from the USFWS that no threatened or endangered species were present on Malmstrom AFB (USAF, 2001). Threatened or endangered wildlife species, and their potential habitats, do not impose a constraint to development on Malmstrom AFB.

3.5 Cultural Resources

Cultural resources are prehistoric and historical districts, sites, structures, artifacts, and any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are typically divided into the following three major categories: archaeological resources, architectural/ engineering resources, and traditional resources.

Archaeological resources are identifiable at locations where prehistoric or historical activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads and bottles). Architectural and engineering resources include standing buildings, dams, canals, bridges, and other structures of historical or aesthetic significance. They generally must be more than 50 years old to be considered for inclusion in the NRHP. Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. They may include archaeological resources, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals.

Significant cultural resources are evaluated for adverse impacts from a federal undertaking. Significant cultural resources are generally those that are eligible or potentially eligible for inclusion in the NRHP. Native American or other ethnic groups also may identify traditional resources as significant. The region of influence (ROI) for cultural resources for this EA consists of Malmstrom AFB.

3.5.1 Historical Setting

Cultural frameworks for the region have been developed defining three major periods of human culture prior to contact with Euro-Americans. The people from the earliest period, from as long ago as 12,000 years ago to about 7,000 years ago, lived by hunting large game such as deer, bison, smaller mammals, and the now-extinct mammoth. They used distinctive lanceolate spear points known as Clovis, Folsom, and Plainview. Archaeological evidence from this period in the vicinity of Malmstrom AFB is usually in the form of surface sites or isolated finds. Little evidence for other aspects of their culture is located on the Base.

During the middle period, from about 7,000 to 1,500 years ago, evidence points to bison as an important part of the native economy, as well as activities other than hunting, including plant collection, cooking, and food storage. Archaeological sites include a variety of projectile points, ground stone tools, and in the latter part of this period, ceramics. In the vicinity of Malmstrom AFB, archaeological sites are found both on the ground surface and buried.

In the most recent period prior to contact with Euro-Americans, from about 1500 to 300 years ago (about A.D. 1700) the variety of projectile points increases and pottery are more evident. Bison were still an important component on the economy. Stone circles are a distinctive type of site associated with this period. During the 18th century, prior to face-to-face contact, horses and trade goods such as beads and metal points made their way to this region through trade. Archaeological resources are found both on the ground surface and buried. When Euro-Americans contacted the Native Americans of this region, they described Blackfoot, Crow, Plains Cree, Gros Ventre, Teton Dakota and Assiniboine as living a highly mobile life centered on bison hunting during the warm part of the year and village dwelling in sheltered areas such as river valleys during the cold seasons. Use of tipis and horses facilitated this lifestyle.

French and British fur traders had come through the upper Missouri River area prior to Lewis and Clark's Voyage of Discovery, but in 1805 the expedition's portage around the Great Falls probably took them across what is now Malmstrom AFB. Their route went between Belt Creek and a point upstream of the city of Great Falls. This exploration presaged later settlements, including Fort Benton to the northeast of the Base during the first half of the 19th century. Forts and trading posts were followed by gold prospectors in the 1850s and 1860s and cattle ranching between 1860 and 1880. The severe winter of 1886-1887 set the stage for sheep ranching to follow cattle ranching as the dominant industry, capped by the Great Northern Railroad reaching Great Falls in 1893. Between 1890 and 1910 homesteading increased, with the accompanying grain production contributing to the economy. The Chicago, Milwaukee, St. Paul and Pacific Railroad (Milwaukee Road) came to Montana, passing through Great Falls in 1909 (Montana Historical Society, 2006). Remnants of this route now form part of the northern border of Malmstrom AFB.

Construction of the Base began in 1942. Initially known as East Base, it was renamed Great Falls Air Force Base in 1947, and in 1956 was again renamed for the vice commander, Col Einar Malmstrom, following his death in a plane crash. In March 1961, construction began on the first launch facility near Malmstrom AFB. The Base played an important role during the Cuban Missile Crisis. Missiles formed an important part of the Malmstrom AFB mission, but over the years other aspects have been added. The 301st Air Refueling Wing was activated at Malmstrom AFB in 1988. Headquarters USAF re-designated the 341st Strategic Missile Wing as the 341st Missile Wing in September 1991. In July 1994, USAF Space Command took over as the Major Command replacing the Air Mobility Command.

Malmstrom AFB now hosts the 819th Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer (RED HORSE). RED HORSE is the first Active Duty and Air National Guard associate unit in the Air Force. The 341st Missile Wing was re-designated the 341st Space Wing in 1997. The 341st Space Wing was re-designated the 341st Missile Wing in 2008.

3.5.1.1 Identified Cultural Resources

A search of the National Register Information System database shows that no current listed National Register resources are located on Malmstrom AFB, although the city of Great Falls is home to several National Register-listed historic buildings (NPS, 2006).

Three archaeological and historic resources surveys have been conducted on Malmstrom AFB proper (USAF 2001b). In 1988, Historical Research Associates conducted a

survey that found a segment of the Chicago, Milwaukee, St. Paul, and Pacific Railroad (now Burlington Northern Santa Fe) that traverses the northern border of the Base (Site 24CA 264). The railroad segment may be eligible for the National Register of Historic Places based on its role in the Euro-American settlement of the region. An archaeological site in the southern part of the Base is considered to be not eligible for the National Register. With the exception of isolated finds, no other cultural resources were identified on Malmstrom AFB.

Malmstrom AFB conducted an architectural inventory in 1996 to identify Cold War resources. The inventory also identified a number of buildings that are eligible, potentially eligible, or potentially eligible pending additional background research (USAF, 2001). None of these facilities are located within the project area.

Significant paleontological resources occur in Montana, mostly in surface and near-surface bedrock. However, Malmstrom AFB is underlain by 30 to 100 feet of glacial sediments, which do not tend to produce paleontological finds; none have been found on the Base (USAF 2001b).

Previous coordination with the Montana State Historic Preservation Office confirmed the presence of only one known National Register-eligible cultural resource (the historic railroad track segment) adjacent to, but not within the proposed project area (USAF 2001b).

3.6 Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is the intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave because it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, several noise measurement scales are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. Zero on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in dBs are calculated on a logarithmic basis. For example, an increase of 10 dB represents a ten-fold increase in acoustic energy, while 20 dB is 100 times more intense, 30 dB is 1,000 times more intense. A relationship exists between the subjective noisiness or loudness of a sound and its intensity. Each 10-dB increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

Sound is characterized by several methods. The most commonly used is the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most

common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Because the sensitivity to noise increases during the evening and at night (excessive noise interferes with the ability to sleep), 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The day/night average sound level (L_{dn}) is a measure of the cumulative noise exposure in a community, with a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. Table 3-3 categorizes the typical range of L_{dn} levels for various functional areas encountered on Malmstrom AFB. In general 30 to 50 dB represents a quiet classification, 65 to 70 dB represents a moderately noisy classification, and 70 to 75 dB represents a noisy classification.

TABLE 3-3
Typical Day-night Noise Levels in Urban Areas in the United States.
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Description	Typical Range of L_{dn} (dB)	Average L_{dn} (dB)
Quiet Suburban Residential	48-52	50
Normal Suburban Residential	53-57	55
Urban Residential	58-62	60
Noisy Urban Residential	63-67	65
Very Noisy Urban Residential	68-72	70

Source: EPA, 1974.

3.6.1 Existing Noise Setting

The most recent installation Air Compatible Use Zone (AICUZ) analysis was completed in 1994, when the 341st ARG was still assigned to Malmstrom AFB. The Base does not currently host an active air wing, thus the runway is currently inactive, with the exception of Huey helicopters, a subordinate squadron of the 341st Space Wing Operations Group. Noise contours show the project area outside of the 65dB contour (Spectrum Sciences and Software, 1994). The airfield on Malmstrom AFB is currently open, and is used by helicopters. There is no AICUZ requirement for helicopters. The runway on Malmstrom AFB is currently closed; therefore, Malmstrom AFB has no requirement to maintain a current AICUZ (Lucas, 2006a).

3.6.1.1 Residential Areas

Vehicular traffic is the primary source of noise near Base residential areas. Single family and duplex homes are situated along 10th Avenue North, adjacent to the vehicle route from the north gate to the Proposed Action sites.

The noise experienced by residential and other noise-sensitive receptors varies according to their distance from the site of the project area and travel route and the number of intervening facilities. Noise typically is attenuated (reduced) 6 dB for every doubling of distance from the source.

3.7 Health, Safety, and Waste Management

This section describes programs and activities currently in place at Malmstrom AFB including general public health and safety responsibilities, worker health and safety protection, solid and hazardous waste management, sewage and stormwater management, environmental remediation activities, pesticide application, and harmful substances.

3.7.1 Public Health Management

The USAF and agencies of the city of Great Falls, Cascade County, the state of Montana, and the federal government protect public health and safety at Malmstrom AFB. The city and county provide police protection and emergency services. The Cascade County Health Department is responsible for monitoring public health and safety issues such as drinking water quality and disease control. The MDEQ regulates waste management, toxic substance reporting, and investigation and cleanup of contaminated sites. The state of Montana also provides technical and financial assistance for occupational health concerns such as asbestos control, radon emissions, and drinking water quality. The 341 CES/CEV (Environmental Flight) provides regulatory guidance to Malmstrom AFB personnel regarding safe use, storage, and disposal of hazardous and toxic substances. The Base has a pollution prevention program that includes minimization of hazardous wastes and recycling.

3.7.2 Worker Safety and Health

Construction activities on Base are governed by the rules and regulations of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) as codified in 29 CFR 1910, "Occupational Safety and Health Standards."

3.7.3 Solid and Hazardous Waste Management

Solid and hazardous waste programs provide for the collection, handling, and disposal of waste materials, response operations to spills of hazardous materials or waste, and management of the IRP. In Montana, hazardous and solid waste issues are regulated by MDEQ.

The Hazardous Waste Management Plan (HWMP) at Malmstrom AFB complies with the mandatory requirements of the MDEQ, Air and Waste Management Bureau, Permitting, and Compliant Division administrative rules. The Base must comply with state regulations, as the state has been authorized by EPA to implement RCRA requirements in Montana (Malmstrom AFB, 2006a).

At Malmstrom AFB, the solid and hazardous waste programs are managed by the Environmental Flight. The Environmental Flight is also responsible for reporting, cleanup, and disposal of spills of hazardous wastes.

Hazardous waste management consists of the collection, storage and transportation of hazardous wastes as defined by RCRA. Hazardous wastes are recorded and processed through the Environmental Flight and Defense Reutilization and Marketing Office.

Malmstrom AFB must meet 40 CFR 240 and DoD Directive 4165.60, as well as state and local requirements for disposal of all solid waste materials. Malmstrom AFB has no active landfills. Solid wastes generated at the Base are disposed of at High Plains Sanitary Landfill, located in Great Falls. Transportation of hazardous wastes to licensed treatment or disposal facilities is managed by the Environmental Flight and the Defense Reutilization and Marketing Office (DRMO).

3.7.4 Sewage and Stormwater Management

Sewage wastewater from the Base is discharged to the city of Great Falls, which manages waste under a service contract with a private sewage treatment management firm.

Stormwater is considered a wastewater discharge by the Clean Water Act. Stormwater is discharged from the Base in accordance with a MPDES General Discharge Permit for Stormwater Associated with Industrial Activity issued by MDEQ. Precipitation that falls or melts in the study area is managed in accordance with the *Malmstrom AFB Storm Water Pollution Prevention Plan* (Malmstrom AFB, 2006c). The SWPPP also mandates that construction discharges and industrial discharges be managed through best management practices, as appropriate. The Base has authorization to discharge storm water under a General Permit for Storm Water Discharge Associated with Small Municipal Separate Storm Sewer Systems (commonly known as an MS4 Permit). This permit is issued by the Montana Department of Environmental Quality and authorizes discharge of storm water from municipal separate storm water systems to state waters, provided several conditions are met. A key condition of this permit, as found in the decision process as stated under Part II,B,5bii, *Post Construction Storm Water Management in New Development and Redevelopment*, is to identify how the program will be specifically tailored to the local community, to minimize water quality impacts, and to attempt to maintain pre-development runoff conditions. The Base is consistent with this condition as evidenced by the incorporation of the LID as a key component of the proposed project.

3.7.5 Environmental Remediation Activities

The USAF is undergoing clean up of contaminated sites created by past activities under the IRP. Malmstrom AFB manages 31 restoration sites. Of those, restoration is complete at 26 sites and for the remaining five sites remedies approved by the Montana Department of Environmental Quality (MDEQ) are in-place. Malmstrom AFB monitors natural, in-situ degradation processes at 4 sites contaminated with petroleum-based constituents and in-situ enhanced reductive dechlorination at fifth site which is a closed landfill. No sites are scheduled for future restoration (Duff, personal communication, 2006).

No IRP sites are associated with Site 1 (Lucas, 2006b). Site 2 was formerly occupied by a gas station and was moved into the IRP program after the gas station closed. The site was

989 restored in accordance with the *Remediation Control and Sampling Plan* (Malmstrom AFB,
990 1997). Materials from the site were excavated, sampled, stockpiled, and transported
991 according to the *Remediation Control and Sampling Plan* (Malmstrom AFB, 1997). Malmstrom
992 AFB submitted a report to MDEQ in 1997, documenting that the site was clean
993 (Lucas, 2006c) following restoration activities at Site 2. The Base currently has received
994 no confirmation from MDEQ.

995 3.7.6 Herbicides, Pesticides, Rodenticides

996 Spraying of herbicides has occurred throughout the Base to control weedy species,
997 pesticides have been sprayed to control insects, and rodenticides have been used to control
998 mice. Because herbicides used for basewide spraying are biodegradable and would have
999 dissipated from the soil in less than 1 year, any herbicides applied by Malmstrom AFB in the
1000 past would likely not be present at this time. Pesticides and rodenticides tend to have
1001 stronger bonds with soils and could potentially still be present in the soils.

1002 3.7.7 Harmful Substances

1003 A radon survey of the Base was performed by the Bioenvironmental Engineering office in
1004 September 1988. The results of that survey categorized Malmstrom AFB as Low Probability.
1005 This signifies that all structures sampled had a concentration of less than 4 picocuries of
1006 radon. At this level, no further action is required.

1007 Disposal of harmful substances such as lead-based paint and asbestos are managed on
1008 Malmstrom AFB according to Air Force Procedure 32-1052 "Facility Asbestos
1009 Management." The existing Club contains asbestos (Lucas, 2006b). Because of the age of the
1010 Club, it is anticipated that the building contains lead-based paint.

1011 3.8 Land Use, Transportation, and Visual Resources

1012 This section describes land use, transportation, and visual resources on Malmstrom AFB.
1013 Land use focuses on general land use patterns, as well as management plans, policies,
1014 ordinances, and regulations. These provisions determine the type of uses that are allowable
1015 and identify appropriate design and development standards to address special use or
1016 environmentally sensitive areas. Transportation addresses roads and circulation in the
1017 project area. Aesthetic qualities are also described.

1018 3.8.1 Land Use

1019 Land use on Malmstrom AFB includes developed areas in the northwestern portion of the
1020 installation and open space and weapons storage in the eastern portion (see Figure 1-1). The
1021 airfield, located in the southeastern portion of the installation, is the dominant land use on
1022 the installation. Light industrial and aircraft operations and maintenance are adjacent to the
1023 airfield. Other land uses in the cantonment area are generally located to the west of the
1024 airfield.

1025 Housing is primarily located in the northwestern portion of the installation. Recreation
1026 facilities are scattered throughout the Base in areas adjacent to the family housing area. Pow

Wow Park is located in the east portion of the installation and includes a manmade pond for fishing. The park also includes playground equipment and a picnic area.

The Site 1 is located within an administrative area of the Base. A softball field is located approximately one block to the north of Site 1. Site 2 is located within an area that has recreational facilities nearby, including a softball field, family camp, Sun Plaza Park, a swimming pool, tennis court, and track facilities. Both sites are within an area that supports light industrial and administrative activities that consists of buildings, paved roads, parking areas, and open space planted with trees, shrubs, turf grasses, and other landscaping.

Adopted plans and programs guide land use planning on Malmstrom AFB. Base plans and studies present factors affecting both on Base and offbase land use and include recommendations to assist on Base officials and local community leaders in ensuring compatible development. The *Malmstrom AFB General Plan* (Malmstrom AFB, 2002a) provides an overall summary of strategic planning initiatives. The plan includes the following six components, which represent a summary of current Base plans:

- Composite Constraints and Opportunities
- Infrastructure
- Land Use
- Capital Improvements Program
- Facilities Excellence Plan
- Five-Year Plan

The Base's *Integrated Natural Resource Management Plan,* (USAF 2001b) is used to coordinate natural resource management.

3.8.2 Transportation

Access to Malmstrom AFB is provided from US Highway 87/89, east of Interstate Highway 15. The Main Gate located on 2nd Avenue North and the Commercial Gate (North Gate) located on 10th Avenue North provide access to the Base. Second Avenue North becomes Goddard Avenue, which serves as the main thoroughfare. Tenth Avenue becomes 72nd Street North and intersects Goddard Avenue. Both entrance routes connect to 57th Street North (Northeast Bypass - Montana Department of Transportation [MDT] Route 5205). Refer to Figures 1-2 for the location of gates and roads within the vicinity of the alternative sites.

Seventy five percent of Base traffic enters the Base through the Main Gate and the remaining 25 percent enter through the North Gate. Peak traffic hours are between 6:45 a.m. to 7:30 a.m. and 4:30 p.m. to 5:00 p.m.

Malmstrom AFB has one stoplight, located at the intersection of Goddard Avenue and 72nd Street North. Site 1 is located on the northwest corner of the Goddard Avenue and 72nd Street North intersection. Access to the proposed CAC parking areas would be planned to not interfere with traffic at the stoplight.

Site 2 is located between 74th Street North and 75th Street North, and is bordered on the northeast by 4th Avenue. The intersection of 74th Street and 4th Avenue is a two-way stop.

The existing Club is located on 4th Avenue North, between 70th Street North and 72nd Street North. The Club has a driveway that enters and exits onto 4th Avenue for off-street access to the main entrance. Parking at the existing Club is facilitated through the use of a large parking lot located on the northeast end of the Club. Access to the parking lot is from 4th Avenue North.

3.8.3 Visual Resources

Malmstrom AFB is located to the east of the city of Great Falls, in rolling plains about 75 miles east of the Rocky Mountains. The Base elevation ranges from 3,400 to 3,500 feet mean sea level. The topography is characterized by broad, gently sloping plains that have been moderately dissected by numerous streams (USAF, 2001).

The Base occupies approximately 3,400 acres. The airfield runway occupies the largest portion of the installation. The Base maintains a consistent design standard that has resulted in a uniformity of architectural design. The residential area specifically reflects modern colonial or ranch style one- and two-story homes with overlapping plank siding (or aluminum if upgrades have occurred) and symmetrical window and door placement.

Site 1 was previously used as a softball field. Remnants of the softball diamond are visible at the site. Native vegetation does not exist on the site, which has been altered or modified by the introduction of grasses in support of its function as a softball field. Trees, planted for landscaping purposes, border the edge of the site along 72nd Street North and Goddard Avenue. The northwest end of the lot supports approximately four to five large shade trees.

Site 2 is currently open space. It was previously the site of a gas station that has since been removed. Native vegetation does not exist on the site, which has been altered or modified by introduction of non-native grasses associated with past development activity. No trees or other vegetation exist on the site.

The site of the Club contains mature landscaping that includes a variety of trees, grasses, and shrubs. The building design is consistent with other facilities on Base. A large parking lot exists on the northeast portion of the site. Small support structures, associated vehicle access, and pavement are located adjacent to the Club.

3.9 Socioeconomics and Environmental Justice

Socioeconomic resources for this analysis are characterized in terms of population and employment, with a particular emphasis on minority, low-income, and youth populations. For the purposes of this analysis, the Region of Influence (ROI) is Malmstrom AFB, with some information provided for Cascade County.

EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," directs federal agencies to address environmental and human health conditions in minority and low-income communities. An analysis of environmental justice helps determine if actions of federal agencies disproportionately and adversely impact the human health and environmental conditions in minority populations, low-income populations, or Native Americans. The approach applied in this section is in

accordance with the *Interim Guide for Environmental Justice within the Environmental Impact Analysis Process*.

In addition to environmental justice issues, are concerns pursuant to EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks." This EO directs federal agencies to identify and assess environmental health and safety risks that might disproportionately affect children.

3.9.1 Population and Employment

Malmstrom AFB has 3,409 active duty military personnel, and of the personnel assigned to the Base, 1,749 (52 percent) reside on Base. These active personnel have a total of 4,544 family members and dependents. In addition, Malmstrom AFB employs approximately 1,163 civilian employees, contractors, and private-business employees. The Base population, including military personnel, family members and dependents, and civilian workers, was 9,072 persons in 2002 (Malmstrom AFB, 2002a).

The city of Great Falls is the seat of Cascade County and the second largest city in Montana with a 2000 population of 56,690 persons. This accounts for 70 percent of the county population (80,357 persons) (U.S. Census Bureau, 2000). Cascade County has approximately 32,547 households with an average household size of 2.41 persons. In a predominantly rural area, Great Falls is largely dependent upon the fluctuations of the agricultural industry. Great Falls residents enjoy a high quality of life attributable to the numerous recreational opportunities and natural wildlife habitat in the area.

The operation of the Base makes an important contribution to the economy of the region through both direct employment and purchases from local businesses. The presence of the Base provides economic stability to the city and the region. Malmstrom AFB's annual payroll obligates $151.6 million to military and civilian employees, and the Air Force contributes an estimated $97.9 million in construction and service contracts and other purchases from local businesses. Malmstrom AFB has a total annual economic impact of over $282 million within a 50-mile radius that includes the counties of Cascade, Judith Basin, Lewis and Clark, Teton, Pondera, and Choteau (Malmstrom AFB, 2002a).

3.9.2 Environmental Justice and Protection of Children

Disadvantaged groups within the ROI, including low-income and minority communities, are specifically considered to assess the potential for disproportionate occurrence of impacts. For the purposes of this analysis, disadvantaged groups are defined as follows:

- Minority population – Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders
- Low-income population – Persons living below the poverty level, according to income data collected in Census 2000
- Youth population – Children under the age of 18 years

According to Census 2000, minorities represent 28.02 percent of the national population. The national population is composed of 12.3 percent Black, 0.9 percent Native American,

3.6 percent Asian, and 12.5 percent identifying a cultural heritage of Hispanic (U.S. Census Bureau, 2000).

Native American and Aleut persons are the most predominant minority group in Cascade County, representing 40 percent of the minority population, followed by persons of Hispanic descent who account for 23 percent of minorities (U.S. Census Bureau, 2000).

Minority persons represent 10.5 percent of both the Cascade County and Montana populations. At the state level, Native Americans and Aleuts represent 60 percent of the minority population and Hispanic persons represent 19 percent of minorities (U.S. Census Bureau, 2000).

Census 2000 data for Cascade County, Great Falls, and Tract 12 specifically address Malmstrom AFB. The areas outside Malmstrom AFB that are boundaries included in Tract 12 historically have not been populated and are used for farming and ranching operations. Therefore, the data for Tract 12 is useful to describe the demographic characteristics of Malmstrom AFB. The demographic makeup of the Malmstrom AFB population differs from the demographic characteristics of the county and state. Minority persons represent 21.8 percent of the Malmstrom AFB population. The Malmstrom AFB population is composed of 31.8 percent Black, 3.2 percent Native American, 12 percent Asian, 3.6 percent Pacific Islander, 16.8 other, and 32.6 percent identify themselves as "two or more races." However, the Census 2000 data for Malmstrom AFB reveals a White-only, (not Hispanic or Latino) population of 3,554 or 78.2 percent. (U.S. Census Bureau, 2000).

Nationally, 12.4 percent of the population lives below the poverty level. Based on Census 2000 data, the incidence of persons in Cascade County with incomes below the poverty level was comparable to state levels accounting for 13.5 percent and 14.6 percent of the population, respectively (U.S. Census Bureau, 2000). The incidence of persons living below the poverty level at Malmstrom AFB is 6.2 percent, far below the national average (U.S. Census Bureau, 2000).

Persons under the age of 18 comprise 25.6 percent of the United States population. The youth population, which includes children under the age of 18, accounts for 26.0 percent of Cascade County's population, compared to 25.5 percent at the state level. The youth population, which includes children under the age of 18, accounts for 36.2 percent of Malmstrom AFB's population, compared to 25.5 percent at the state level (U.S. Census Bureau, 2000).

3.10 Utilities

Utility resources for this analysis include the water distribution, sanitary sewer system, electrical distribution system, natural gas, and central heating systems on Malmstrom AFB.

3.10.1 Water Distribution

The Missouri River serves as the principal source of potable water for Malmstrom AFB and the city of Great Falls (USAF, 2001). Potable water is supplied to Malmstrom AFB by the city of Great Falls, under a contract for 1.26 million gallons per day and 460 million gallons per year. A 12-inch-diameter water supply line runs parallel to 3rd Avenue and South

Avenue, and a 12-inch-diameter main water line runs parallel to 2nd Avenue North. The two 12-inch-diameter lines supply two ground-level storage tanks with capacities of 600,000 and 1,100,000 gallons. There are three elevated storage tanks on the installation with capacities of 500,000; 8,000; and 250,000 gallons respectively.

3.10.2 Sanitary Sewer System

Malmstrom AFB operates and maintains a wastewater collection system. The system was constructed in the 1940s and expanded in the 1950s and 1960s to accommodate the family housing areas on Base. Malmstrom AFB, under contract to the city of Great Falls, transfers all wastewater via a 10-inch-diameter force main that discharges into a manhole behind the Minuteman Village Housing Area, which then travels to the city's treatment plant.

3.10.3 Electrical Distribution System

Malmstrom AFB purchases electricity from the Northwestern Energy. Electrical services are provided through a 100 kilovolt transmission line, which terminate at the Base electrical substation. A backup line is available in case of a catastrophic substation failure. Approximately 53 percent of the electrical distribution lines on Base are underground. Six primary service feeders supply facilities on Base (Malmstrom AFB, 2002a).

3.10.4 Natural Gas

Malmstrom AFB is supplied with natural gas from Energy West, via a 12-inch-diameter steel pipeline that was installed in 1953. The purpose of the natural gas system is to meet the heating requirements of the Base. The gas distribution system was originally installed as steel piping, and approximately half of the line has been replaced with polyethylene lines, with the remainder scheduled for replacement.

3.10.5 Central Heating System

A central heating plant burns coal or natural gas to provide high temperature, hot water to heat the installation (USAF, 2001). The heating plant, constructed in 1986, has three boilers and is capable of producing 240 million British thermal units (Malmstrom, 2002a).

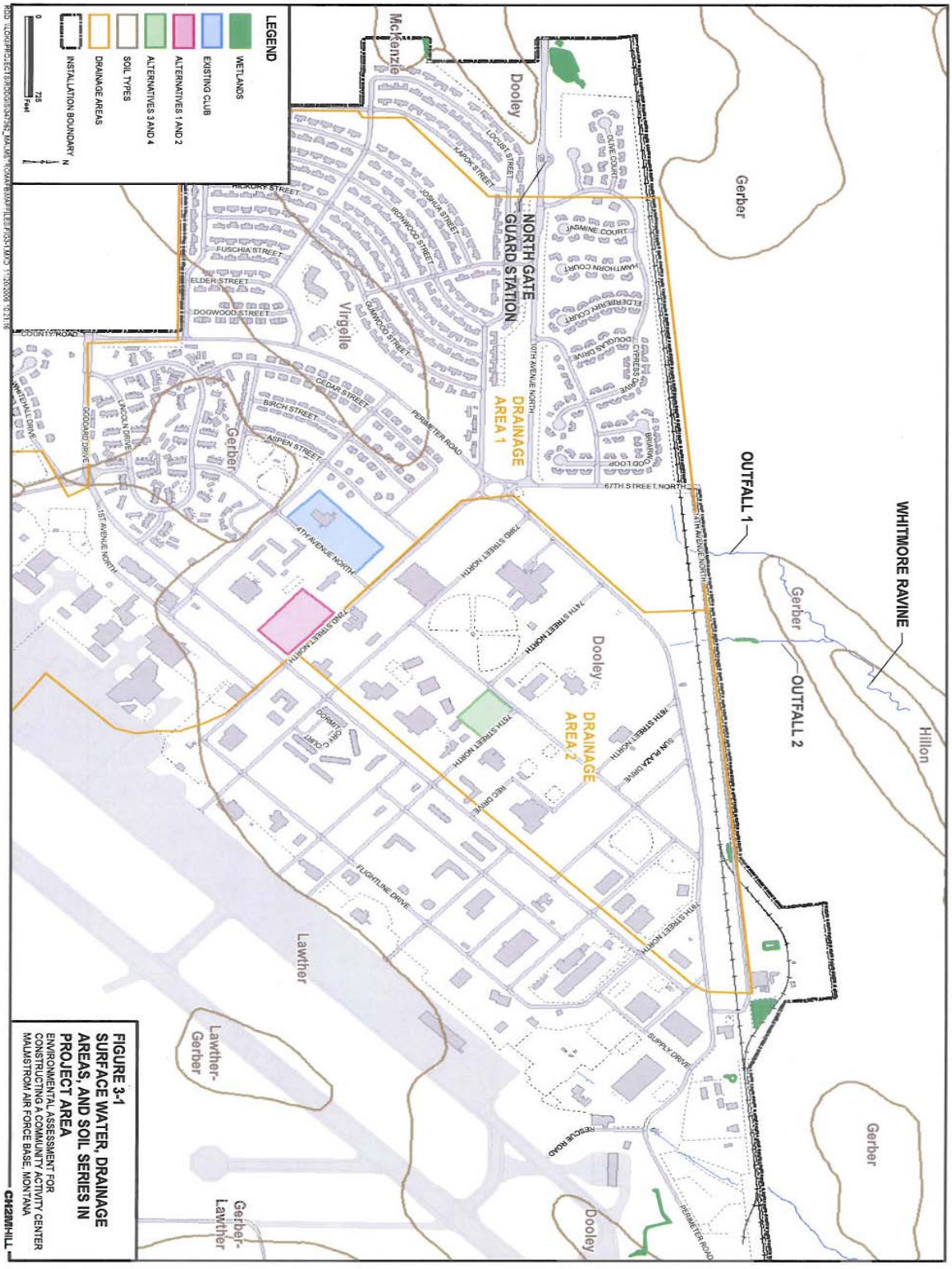


Figure 3-1. Surface Water, Drainage Areas, and Soil Series in Project Area

SECTION 4.0

Environmental Consequences

This section provides the regulatory background, as applicable, for the various environmental resource areas and evaluates potential impacts resulting from the construction and operation of the proposed CAC at the alternative action sites. The potential impacts to the human and natural environments were evaluated by comparing the alternatives to the existing environmental baseline conditions described in Section 3.0. The subsection for each environmental resource or issue assesses the anticipated direct and indirect impacts, considering both short and long-term effects of all alternatives. Except for the discussion of stormwater, potential impacts resulting from implementation of Alternatives 1 and 2 and Alternatives 3 and 4 are discussed jointly because the only difference between the alternatives is the installation of an LID system for stormwater management.

4.1 Air Resources

The significance of impacts to air quality is based on federal, state, and local pollution regulations or standards. Air quality impacts from a proposed activity or action would be significant if they result in any of the following:

- Increase ambient air pollution concentrations above any NAAQS
- Contribute to an existing violation of any NAAQS
- Interfere with or delay timely attainment of NAAQS
- Impair visibility within any federally mandated Class I area

According to the General Conformity Rule in 40 CFR 51, Subpart W, any proposed federal action that has the potential to cause violations, as previously described, in a nonattainment or maintenance area must undergo a conformity analysis.

As previously discussed in Section 3.1, Section 169A of the CAA established the PSD regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is more than 50 miles from the region potentially affected by the Proposed Action.

4.1.1 Alternatives 1 and 2

Potential impacts from construction of the CAC at Site 1 include emissions that are expected to occur as a result of engine exhaust from added vehicle trips of construction workers and off-road construction equipment, including earth moving equipment and trucks. These emissions would primarily consist of NO, particulate matter, CO, and VOCs.

Potential effects created by construction activities would include road dust entrainment from construction vehicles and dust from temporary storage piles.

Fugitive dust emissions would be minimized and controlled by implementation of dust control measures in accordance with standard construction practices. For example, frequent spraying of water on exposed soil during construction, proper soil stockpiling methods, and prompt replacement of groundcover or pavement are standard procedures that would be used to minimize the amount of dust generated during construction. Using efficient grading practices and avoiding long periods when engines are idling would reduce combustion emissions from construction equipment.

Emissions generated from construction of the CAC at Site 1 would have temporary, short-term adverse impacts on air quality. Demolition activities associated with the Club would have similar impacts as that of the construction of the CAC. All construction-related impacts are expected to be local (i.e., confined to the construction site area), limited to the duration of the construction, and, therefore, less than significant.

Long-term adverse impacts would be limited to operation emissions from the new CAC. Implementation of the action at Site 1 would increase the number of stationary sources at the Base, and would result in a minor permanent increase in emissions from stationary sources. The stationary source increase would arise from the use of natural-gas water heaters, ovens, stoves, and furnaces, which would not significantly impact the air quality at Malmstrom AFB or the region. In addition, increase in emissions from stationary sources would eventually be offset by the cessation of operations of the Club.

Emissions from vehicular traffic on Base would likely increase as individuals from the Base use the larger facility more often. It is likely that these individuals would use the facility more often since it would be new and have updated amenities, thus equating to more vehicle trips to and from the facility. During the time of dual use of the existing Club and the CAC, vehicular traffic, and associated emissions, would increase when functions occur simultaneously at the CAC and the Club. Increased emissions could adversely affect those sensitive to such conditions; however, it is likely that this affect would be short-term. Once the Club is demolished, emissions from vehicular traffic would be diminished. Although a slight increase over current conditions would be anticipated from use of the new facility, this impact would not be considered significant.

4.1.2 Alternatives 3 and 4

Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.1.3 No Action Alternative

Under the No Action Alternative, construction of the CAC would not occur; therefore, no impacts to air resources would occur.

4.2 Water Resources

Construction activities could affect water resources by physical disturbances and inadvertent material releases (e.g., introduction of sediment and chemical contaminants) into surface and groundwater. An impact to water resources at Malmstrom AFB could be considered significant if an aquifer, groundwater table, or surface water body is altered or degraded, resulting in a measurable and persistent change in groundwater recharge, water

quantity, or water quality. An impact would also be considered significant if surface water or groundwater quality were degraded to a point such that it resulted in severe or long-term violations of federal or state water quality criteria.

The Base currently has authorizations to discharge stormwater under the following permits and plans related to surface water and storm water discharge:

- General Permit for Storm Water Discharge Associated with Small Municipal Separate Storm Sewer System (MS4); Permit Number MTR 040000.
- General Permit for Storm Water Discharges Associates With Industrial Activity Permit Number MTR100000
- Storm Water Pollution Prevention Plan (Malmstrom AFB, 2005a)

4.2.1 Groundwater

4.2.1.1 Alternative 1

On Base, a deep aquifer is located 100 to 500 feet below ground surface and shallow groundwater is encountered above 25 feet below ground surface. Construction, demolition, and operations associated with this alternative would not reach the deep aquifer, or release water in a way that would impact the deep groundwater aquifers. As such, the deep aquifers would not be adversely affected by this alternative, and no significant impacts to them would result.

In other areas on the Base, construction for urban use, such as housing developments, has altered the sub-surface soils by replacing a portion of them with concrete sewer systems, stormwater pipes, and outfalls to effectively move wastewaters off site. This, in turn, has provided some of the shallow groundwater areas with an artificial flow-way. Groundwater that was once contained by clay soils now flows more freely along these man-made corridors. If construction of the CAC adds additional sub-surface water conveyance systems, it is possible that increases in groundwater flow to Whitmore Ravine will occur. Furthermore, construction of the underground utility network of the CAC will likely contribute to adverse groundwater affects by increasing groundwater flow and incrementally contributing to erosion in Whitmore Ravine and sedimentation in the Missouri River. Creating these artificial flow-ways would likely exacerbate problems in an already unstable coulee. Thus, construction of the CAC as a stand-alone project may adversely affect groundwater in the short-term, and this affect would likely be considered adverse in the long-term. However, the proposed project also calls for the demolition of the existing Club. With demolition of the Club, the existing underground wastewater system would be removed and the overall impacts to groundwater would likely be offset. The overall long-term affects to groundwater are, therefore, considered less than significant.

4.2.1.2 Alternative 2 (Preferred)

In addition to the construction of the CAC and eventual demolition of the existing Club, this alternative includes on-site LID. Capturing runoff and allowing it to infiltrate the ground is generally considered an ecological benefit aimed at increasing water quality. However,

impacts to groundwater associated with implementation of Alternative 2 would be similar to those discussed for Alternative 1.

4.2.1.3 Alternative 3

Impacts anticipated from implementation of Alternative 3 would be as discussed for Alternative 1.

4.2.1.4 Alternative 4

Impacts anticipated from implementation of Alternative 4 would be as discussed for Alternative 2, although the smaller size of the LID at this site would decrease the beneficial affects of stormwater infiltration when compared to Alternative 2.

4.2.2 Surface Water

4.2.2.1 Alternative 1

Indirect impacts to surface water, such as the impacts from construction related activities, would be minimized to the greatest extent through implementation of Best Management Practices. Such practices could include, but would not be limited to, construction of silt fences around the perimeter of the construction site to limit erosion and sedimentation; controlling offsite transport of sediments with wheel wash facilities and regular cleaning of construction entrances, constructing berms around hazardous material containers and keeping them in upland sites, cleaning construction equipment with water above 140 degrees Fahrenheit prior to entering the construction site to remove grease and other adverse materials, and ensuring equipment does not leak oils, antifreeze, or other hazardous liquids. Construction sites also would be either temporarily or permanently stabilized if anticipated to be left exposed for more than 10 days in order to minimize erosion of bare soils. Direct impacts to surface water, such as increased water runoff from impermeable surfaces, are discussed in Section 4.2.3 Stormwater.

4.2.2.2 Alternative 2 (Preferred)

Indirect impacts to surface water under this alternative would be the same as described under Alternative 1, and the direct impacts to surface water are discussed in Section 4.2.3 Stormwater.

4.2.2.3 Alternative 3

Indirect impacts to surface water under this alternative would be the same as described under Alternative 1, and the direct impacts to surface water are discussed in Section 4.2.3 Stormwater.

4.2.2.4 Alternative 4

Indirect impacts to surface water under this alternative would be the same as described under Alternative 1, and the direct impacts to surface water are discussed in Section 4.2.3 Stormwater.

4.2.3 Stormwater

It is commonly accepted that the construction of facilities and other alterations to native conditions change a watershed's response to precipitation. The most common effects associated with an increase in impermeable surfaces are reduced infiltration and decreased travel time, which increase peak discharges and runoff volume. Runoff volume generally is determined by the amount of precipitation and by infiltration characteristics related to soil type, soil moisture, antecedent rainfall, cover type, impervious surfaces and surface retention. Travel time is determined primarily by slope, the length of the flow path, depth of the flow, and roughness of flow surfaces. Peak discharges are based on the relationship of these parameters and on the drainage area of the watershed, the location of the proposed development, the effect of any storage and other natural or manmade active or passive control works, and the time distribution of rainfall during a storm event (USDA Technical Release 55). Incremental increases of impervious surface may combine to alter peak events or baseline flow in a watershed. Increased recharge or improved water quality are examples of beneficial impacts.

Smaller storm events up to the 1-year to 1.5-year return interval usually do not cause channel erosion in natural streams. In a stable streambed, a larger event (2-year or larger) could cause erosion. A stream channel becomes unstable when the natural protection provided by larger channel bed material (e.g., gravel and cobbles) and vegetation is removed and the underlying sand and smaller material becomes susceptible to erosion and downstream transport. After a channel is destabilized, the smaller events (up to a 2-year return interval) are more likely to be erosive to the channel.

The area to be paved from construction of the CAC represents approximately 0.05 percent of the total area of Malmstrom AFB. The paved area at Site 1 (under Alternatives 1 and 2) would result in an estimated 0.8 percent (1.89 acres of 249.1 acres) increase in impervious area in Drainage Area 1. The increase in impervious area at Site 2 (under Alternatives 3 and 4) would be an estimated 2.5 percent (1.89 acres of 76.6 acres) of Drainage Area 2. Implementation of stormwater LID management measures under Alternatives 2 and 4 would help to offset the impervious surfaces by providing varying degrees of stormwater detention.

4.2.4 Alternative 1

Construction of Alternative 1 could result in short-term adverse impacts to surface and stormwater runoff. During construction, runoff could increase the introduction of sediments into Whitmore Ravine, and subsequently the Missouri River, from particles dislodged during earth-moving activities and during frequent storm events. Other impacts to receiving waters could include potential contamination due to inadvertent leaks and spills of fuels and lubricants from construction equipment. Potential impacts associated with any erosion or inadvertent spills would be avoided or minimized with implementation of appropriate best management practices during construction, such as those used to reduce or slow the runoff across construction sites (see Annex P, Malmstrom AFB Storm Water Pollution Prevention Plan [MAFB, 2006c]). In addition, construction of Alternate 1 would require obtaining authorization under a General Permit for Storm Water Discharges Associated with Construction Activity (General Permit) because this construction activity would disturb more then 1 acre (MDEQ, 2003). Construction activities would comply with

all applicable restrictions in the General Permit and the Storm Water Pollution Prevention Plan (Malmstrom AFB, 2006c). Construction-related impacts are expected to be local (i.e., confined to the construction site), and limited to the duration of the construction, and therefore, would be considered less than significant with the implementation of best management practices.

Construction of the CAC and associated parking lot would increase the amount of impervious surface within the area. Approximately 1.89 acres would be required to construct the CAC and the associated parking lot, which would increase the area of impervious surface within Draining Area 1 by an estimated 0.8 percent (1.89 acres of 249.1 acres within Drainage Area 1). An increase in impervious surface would increase stormwater flow on-Base and contribute to stormwater flow leaving the Base. Additional stormwater flow entering Whitmore Ravine would likely result in increased erosion, and subsequently, increased sedimentation in the Missouri River.

An increase in stormwater flow from the additional paved area could be considered adverse because any incremental increase in flow or erosion to Whitmore Ravine would only exacerbate an already adverse situation. The neighboring landowners in the Whitmore Ravine drainage have expressed concern regarding perceived changes in the existing character of Whitmore Ravine. Reasonable disagreement continues to exist regarding the quantitative and qualitative stormwater impacts to Whitmore Ravine and the quantitative and qualitative contribution of the stormwater or groundwater discharge to Whitmore Ravine by several landowners. Malmstrom AFB had contractors conduct a comprehensive study of Whitmore Ravine and an appropriate segment of the Missouri River to quantify, evaluate, and help determine the contribution or environmental significance of the alleged impacts. The study concluded that multiple factors are contributing to erosion of the Ravine and sedimentation in the Missouri River, and determined that even the slightest increase in flow from precipitation or runoff is a contributing factor.

Demolition activities associated with the existing Club would have similar construction related impacts to water resources as that described for the construction of the CAC. Similar Best Management Practices would be implemented during demolition, thus stormwater during demolition would be contained on-site, and these impacts would be considered less than significant. With demolition of the existing Club, approximately 3.8 acres of impervious surface would be removed and returned to a landscaped state. Demolition of these facilities would decrease the amount of impervious surface overall within Drainage Area 1 by approximately 1.5 (3.8 acres of 249.1 acres) percent. Returning the area to a landscaped state would increase infiltration and reduce the amount of stormwater flow from the site, resulting in a potentially beneficial impact. However, because the Club would be removed at a future date, the reduction of impervious surface is not considered an immediate benefit in the analysis of impacts form stormwater under this Alternative. During the time that the CAC and the existing Club are in simultaneous operation, short-term adverse effects to Whitmore Ravine would be anticipated from the increased surface and stormwater flows, and long-term adverse affects would follow. When the Club or other equivalent sized structure within the same drainage is demolished, the adverse affects caused by the increased surface water and stormwater would be off-set, possibly even reduced, and no long-term affects would be anticipated. Thus, in the long-run, the impacts to Whitmore Ravine would not be considered significant.

4.2.5 Alternative 2 (Preferred)

Implementation of Alternative 2 would have similar construction related impacts as those that would occur under Alternative 1. Refer to Alternative 1 for information on potential construction, operation, and demolition impacts to stormwater resources from implementation of Alternative 2.

Because Malmstrom AFB recognizes its responsibility for environmental stewardship, the Base would implement measures to minimize erosion and sedimentation under Alternative 2, with implementation of LID. To reduce the stormwater flow leaving Site 1, LID features would be designed to manage stormwater runoff from frequent storm events and up to the 10-year 2- and 24-hour storm event. Such features would include taking advantage of the proportionately large amount of open space around the perimeter of the proposed building site to help disperse runoff over vegetated areas well away from the buildings foundation. This would serve to dramatically slow runoff rate and increase infiltration and evapotranspiration. Due to the extremely limited infiltration capacity of the existing soils, the success of the design would be highly dependent upon limiting the amount of runoff collected at any one location. Thus, runoff dispersion within vegetated areas of the site would be a critical element of the design. Additionally, runoff reduction features would include ground-shaping with gentle slopes, shallow depths, and planting of stable vegetation to limit flow velocities in the area. A shallow detention pond would be constructed with 5:1 or flatter side slopes and would contain a control structure to limit flow and volume discharges for storms up to the 10-year event. Additionally, the pond would be capable of handling larger flows from the occasional larger storm events. The pond would have a freeboard to contain the 25 year event but not necessarily completely control the discharge rate. A control structure would be connected to the existing (48") storm line running along the north side of the site. It is anticipated that upon implementation of LID, incremental runoff from frequent storm events would not occur.

Because Alternative 2 includes the implementation of LID as part of the project, downstream effects resulting from stormwater flow would not be considered adverse or significant. Once the Club is demolished, the overall response to the LID would be even better.

The Corps of Engineers, Malmstrom Air Force Base, and its designers assessed Site 1 and the proposed project, and concluded that the proposed project with LID can retain existing runoff characteristics after construction of the CAC from storms that equate to the 10-year event (2 and 24hr rainfall). Some components of the design have already been identified as the main features of the stormwater system. These features would be designed as specified in the City of Great Falls Storm Drainage Manual and in general accordance with the Environmental Protection Agency's International Stormwater Best Management Practices (the features would be modified somewhat to suit local conditions). These practices also are recognized by the Montana Department of Environmental Quality. The goal for the stormwater management system would be to control peak runoff volume and flow rates resulting from the 10-year return period, and below, limiting the volume and peak flows exiting the site to no more than those that occurred under present development. Finally, the Corps of Engineers and the Base would continue to refine these features as the design

progresses. The Corps would offer those engineering designs and distribute them to interested parties, if requested, as they become available.

4.2.6 Alternative 3

Site 2 has similar groundwater and surface water resources and existing conditions as Site 1. Implementation of Alternative 3 would have similar construction, operation, and demolition impacts as those described for Alternative 1. Refer to Alternative 1 for information on potential construction, operation, and demolition impacts to water resources from implementation of Alternative 3.

4.2.7 Alternative 4

Implementation of Alternative 4 would have similar construction, operation, and demolition impacts to those that would occur under Alternative 2. Operational impacts under this alternative would not be as beneficial as those under Alternative 2, due to the smaller size of the LID and the inability to capture and detain storm events over the two-year frequency.

Because Alternative 4 includes the implementation of LID as part of the project, adverse downstream effects resulting from stormwater flow after implementation of this alternative are anticipated to be less than significant.

4.2.8 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur; therefore, no changes in impacts to water resources would occur.

4.3 Geological Resources

Many of the soils known to exist on Malmstrom AFB have high clay content. These soils are expansive under moist conditions and have caused foundation related problems.

4.3.1 Alternatives 1 and 2

No significant adverse effects resulting from implementation of either Alternatives 1 or 2 at Site 1 are anticipated because the construction and operation of the CAC would not change the underlying geology of the site. Minor elevation changes would result from site grading and preparation during construction. No change in the geologic and topographic conditions would occur during operation; therefore, no adverse effect would result from implementation of Alternatives 1 or 2.

Construction of the proposed CAC at Site 1 would disturb surface soils and permanently change the ground surface from a soil surface (pervious) to a paved surface (impervious). Total temporary disturbance could cover the entire area of Site 1 (approximately 3.8 acres) during construction, including access and staging areas. The area of permanently altered surface could encompass the entire site.

Disturbance to soils would generally occur during construction. Heavy equipment would be used to grade the site, move and compact soils, excavate foundations, and remove debris in construction and paving areas. Site 1 is within the Dooley soil series (Ecosystems

Research Group, 2006). The ground disturbing activities that would occur during construction of the CAC might expose other underlying soils. A geotechnical study of the building site would be conducted to ensure the design of the facility is appropriate for site conditions. Implementation of standard engineering design and construction practices would minimize negative impacts to soils during construction and, therefore, no adverse effects to soils would potentially occur due to construction at Site 1.

Operation of the CAC at Site 1 would not result in an adverse long-term impact to site soils because disturbed soils would be landscaped in accordance with Malmstrom AFB landscaping standards in the Malmstrom AFB Facilities Excellence Plan (Malmstrom AFB, 2002b).

Demolition of the Club could have a beneficial impact on soils because the demolition activity would include removing paved (impervious) surfaces, which could result in the Club site returning to a partially unpaved state. Demolition plans for the Club include partial removal (approximately 50%) of the existing parking lot in addition to the Club itself. Soils that would be exposed during demolition would be landscaped in accordance with the Malmstrom AFB Facilities Excellence Plan specifications for landscape architecture (Malmstrom AFB, 2002b).

4.3.2 Alternatives 3 and 4

The construction and operation impacts to soils at Site 2 would be similar to those described for Alternatives 1 and 2. Site 2 is also located within the Dooley soil series.

Total temporary disturbance could cover the entire area of Site 2 (approximately 2.1 acres), during construction, including access and staging areas. The area of permanently altered surface could encompass the entire site.

4.3.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur. Therefore, no impacts to geological resources or soils would occur.

4.4 Biological Resources

Direct disturbance to biological resources includes excavation and removal of existing habitat, and, noise generated during operation of the facility. Indirect impacts to biological resources could also result from noise and dust generated during construction.

4.4.1 Alternatives 1 and 2

Site 1 is a former softball field that is vegetated with non-native turf grasses and landscaped trees. Wetlands (i.e., riparian, vernal pools or meadows) are not located on the site. No special status plant or animal species are known to exist on Malmstrom AFB (USAF, 2001; NHP, 2006) and, therefore, neither wetlands nor special status species would be impacted by implementation of either of the alternatives. Short-term, construction related impacts would occur to resident species; however, similar habitat conditions are located near the proposed construction area so finding alternative feeding and sheltering habitat for these resident species would not be problematic.

Surface disturbance associated with implementation of either of the alternatives can result in an increased risk of invasion by noxious weeds. Prompt re-vegetation of all disturbed areas after construction would be conducted. Noxious weeds are also a concern on dirt piles during construction as dirt piles tend to be the major source of most "weeds" found on base. A green cover of rye grass would be used to help control invasive weeds on these areas as rye grass generally out-completes invasive weeds, helps keep the soils in place during wind storms and rains: reducing erosion, and doesn't require watering. Upon final regarding of dirt piles, as the rye grass is "turned" into the soil, it provides increased organic matter thereby improving the soil in it final use. Given the limited amount of biological resources at Site 1, no significant impacts to biological resources are anticipated through implementation of Alternative 1 or 2.

4.4.2 Alternatives 3 and 4

Site 2 is an open field that consists of non-native turf grasses. No trees or shrubs are present at the site. Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.4.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur; therefore, no impacts to biological resources would occur.

4.5 Cultural Resources

Federal regulations and guidelines have been established for the management of cultural resources. Section 106 of NHPA, as amended, requires federal agencies to take into account the effects of their undertakings on historical properties. Historical properties are cultural resources that are listed in, or eligible for listing in, the NRHP. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have been identified as important to Native Americans as outlined in the American Indian Religious Freedom Act and EO 13007, "Indian Sacred Sites." *American Indian and Alaska Native Policy* (DoD, 1999) provides guidance for interacting and working with federally-recognized American Indian governments. DoD policy requires that installations provide timely notice to, and consult with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or American Indian lands.

Analysis of potential impacts to cultural resources considers direct impacts that could:

- Physically alter, damage, or destroy all or part of a resource
- Alter characteristics of the surrounding environment that contribute to the resource's significance
- Introduce visual or audible elements that are out of character with the property or alter its setting

- Neglect the resource to the extent that it deteriorates or is destroyed

Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts generally result from increased use of an area.

4.5.1 Alternatives 1 and 2

All undisturbed areas at Malmstrom AFB have been surveyed and no National Register-eligible archaeological resources have been identified. Furthermore, the depositional environment is such that there is little potential for deeply buried archaeological remains. It is unlikely that the construction effort would affect archaeological resources because buried cultural material is unlikely to occur in the depositional environment.

Use of existing roads along the route proposed for hauling material to the construction site would not affect archaeological or architectural resources. The portion of the Chicago, Milwaukee, St. Paul and Pacific Railroad (Site 24CA 264) that borders the northern boundary of the Base would not be affected by the haul route or any ground disturbing activities at Site 1.

The Club, located in Building 1600, is not listed as a cultural resource or potential cultural resource on Malmstrom AFB (Malmstrom AFB, 2002a) and, therefore, demolition of this structure would not result in a significant impact to cultural resources.

Impacts to traditional resources are not expected under the alternatives. To date, no traditional resources have been identified within Malmstrom AFB. In the event that archaeological resources are encountered in the course of any aspect of implementation of either of the alternatives, compliance with Section 106 of the NHPA, including NRHP evaluation of all identified resources, would be necessary prior to completing the Proposed Action.

4.5.2 Alternatives 3 and 4

Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.5.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur; therefore, no impacts to cultural resources would occur.

4.6 Noise

This section describes noise impact criteria and discusses potential project-related noise impacts. Potential future project-related noise impacts were determined by analyzing anticipated changes in noise exposure attributable to implementation of the alternatives at identified noise-sensitive locations. Noise exposure changes would likely result from construction activities at the proposed sites. After construction, change in noise levels are anticipated to increase slightly during use and operation of the facility; however, these changes are consistent with nearby noise levels of other urban settings on Base.

Typical construction-related noise is expressed in terms of schedule, equipment used, and types of activities. The noise level would vary during the construction period, depending on the construction phase. Construction can generally be divided into the following five

phases, in which different types of construction equipment are used (EPA, 1971; Barnes et al., 1977; Miller et al., 1978):

1. Site preparation and excavation,
2. Concrete pouring,
3. Steel erection,
4. Mechanical ,
5. Cleanup.

The EPA Office of Noise Abatement and Control and the Empire State Electric Energy Research Company have extensively studied noise from different types of construction equipment and construction sites (EPA, 1971; Barnes et al., 1977). Use of these findings is conservative, because, since these studies were performed, public concerns about the adverse effects of noise have resulted in the inclusion of noise controls in construction-equipment design.

Table 4-1 lists the expected noise levels 50 feet from the site during construction, according to the types of construction activities that might occur during construction. The table includes construction equipment with the potential to result in the greatest noise levels during each phase of construction. Table 4-1 also lists the long-term composite average or equivalent site noise level (which represents noise from all equipment). The composite levels are occasionally lower than the individual levels because the loudest equipment would not be operating continuously throughout the construction phase.

TABLE 4-1
Typical Construction Equipment and Composite Site Noise Levels
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Construction Phase	Loudest Construction Equipment	Equipment Noise Level at 50 feet (dB)	Composite Site Noise Level at 50 feet (dB)
Site Preparation and	Dump truck	91	89
Excavation	Backhoe	85	
Concrete Pouring	Truck	91	85
	Concrete mixer	85	
Steel Erection	Derrick crane	88	89
	Jackhammer	88	
Mechanical	Derrick crane	88	84
	Pneumatic tools	86	
Cleanup	Rock drill	98	79
	Truck	91	

Sources: EPA, 1971; Barnes et al., 1977

Noise dissipates by atmospheric attenuation as it travels through the air. Other factors that can affect the amount of attenuation include ground surface, foliage, topography, and humidity. Noise associated with construction activities would be temporary, occur during daytime hours, and vary in levels depending on the sources in use, types of activities, and distance from the source.

4.6.1 Alternatives 1 and 2

There are no sensitive receptors near Site 1, which is situated approximately 650 feet from Base residential housing. Noise levels are expected to be at or below background levels by

the time they reach any offsite receptors and below 65 dB once the construction-related sounds reach the nearest noise sensitive receptor.

The Club is located approximately 250 feet from the nearest residential area. The residents could experience demolition-related noise impacts that would vary depending on the demolition phase.

Noise from construction and demolition activities would temporarily impact residents in the housing areas. The impact is anticipated to be minimal, given the distance from the sites to the residential areas. Any potential temporary increase in noise from construction and demolition activities would primarily occur during day-time business hours.

The proposed CAC would have similar operational noise as administrative buildings in the vicinity upon completion and use.

Neither construction nor operation of the CAC is expected to result in significant noise impacts at Site 1.

4.6.2 Alternatives 3 and 4

Site 2 is located approximately 1,500 feet from the nearest Base residential area. Impacts would be of the same type but of lesser magnitude as described for implementation of Alternatives 1 and 2.

No significant noise impacts due to construction or operation of the CAC would occur at Site 2.

4.6.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur; therefore, no impacts to sensitive noise receptors would occur.

4.7 Health, Safety, and Waste Management

Worker safety is the primary health and safety concern during construction activities. Inherent risks are associated with construction operations. The construction contractor would be subject to rigorous safety management requirements as specified in their contract. These requirements are primarily associated with workplace safety practices mandated by the OSHA. With implementation of the required safety precautions, no significant safety impacts are anticipated.

The U.S. Congress passed the RCRA in 1976 to protect human health and the environment from the mishandling of solid and hazardous waste and to encourage the conservation of natural resources. RCRA requires a system for managing hazardous and universal wastes. Regulations adopted by EPA in 40 CFR Sections 260 through 279 carry out RCRA's mandate. The state of Montana has been authorized by EPA to implement RCRA requirements in Montana.

Base solid and hazardous waste programs provide for the collection, handling, and disposal of waste materials, response operations to spills of hazardous materials or waste, and management of the IRP. Malmstrom AFB has procedures in place for handling and

disposing of wastes, hazardous materials, and fuels. The HWMP at Malmstrom AFB complies with the mandatory requirements of the MDEQ, Air and Waste Management Bureau, Permitting, and Compliant Division administrative rules. The Solid Waste Management Plan (SWMP) (Malmstrom AFB, 2003) provides procedures for disposal and diversion of solid waste at Malmstrom AFB. All project alternatives would comply with these plans.

4.7.1 All Alternatives

Site 1 is not known to contain hazardous waste. Implementation of Alternatives 1 and 2 are not expected to result in adverse affects or significant impacts.

Site 2 was formerly occupied by a gas station that has since been closed and removed. The site was included in the IRP and cleanup of the site was completed by Malmstrom AFB. The Base submitted a report to MDEQ in 1997, documenting that the site was clean (Lucas, 2006c) following restoration activities. The Base has not received concurrence with its determination from MDEQ. Coordination with MDEQ prior to construction might be required and, therefore, the administrative effort to gain approval for construction might be greater for Site 2 than for Site 1.

During excavation, onsite workers might encounter small pockets of isolated soil that have a petroleum odor. The construction specifications must state clearly that petroleum-contaminated soil could be encountered during construction and require the contractor to implement a site safety and health plan prepared by a certified industrial hygienist. In the unlikely event that hazardous contaminants are encountered, the materials might need to be removed by the contractor and disposed offsite in accordance with applicable rules and laws. It is anticipated that the soil would test below the Montana threshold level of 50 ppm for petroleum, oils, and lubricants (Lucas, 2006c).

During construction of the proposed CAC and demolition of the Club, contractors would comply with all state and federal regulations and Base procedures with respect to management, abatement, and disposal of hazardous waste generated during construction or demolition.

The Club contains asbestos, and lead-based paint is believed to be present. Asbestos and lead-based paint surveys and abatement would be conducted prior to demolition of the Club. Demolition activities would be conducted in accordance with safety management requirements as specified in the construction contract. Hazardous waste generated during demolition would be disposed of in accordance with state and federal regulations and transported to appropriate landfills according to the HWMP and SWMP procedures. Implementation of Alternatives 3 and 4 could result in similar construction related adverse effects, however, safety, health, and abatement plans will be implemented, thus the affects are not considered significant.

4.7.2 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur; therefore, no construction related impacts to health and safety or waste management would occur. Continued use of the existing Club could result in health and

safety issues to individuals at the Base due to the absence of internal fire sprinklers, and the presence of asbestos and possible lead-based paints.

4.8 Land Use, Transportation, and Visual Resources

The impact analysis for land use focuses on general land use patterns and land management practices. The methodology to assess impacts on individual land uses requires identification of those uses and determination of the degree to which those areas would be affected. Impacts to transportation are assessed with respect to the potential for disruption or improvement of current transportation patterns and systems, deterioration or improvement of existing levels of service, and changes in existing levels of safety. Determination of the significance of the impact on visual resources is based on the level of visual sensitivity in the area.

4.8.1 Alternatives 1 and 2

The proposed CAC at Site 1 would occur in an area of the Base that would be consistent with surrounding administrative and industrial land uses. The CAC would meet current Air Force standards and would be visually consistent with current and proposed Malmstrom AFB building design.

Construction traffic associated with the implementation of either of the alternatives would comprise only a small portion of the total existing on Base traffic. Increases in traffic volumes associated with construction activity would be temporary. Upon completion of construction, some long-term impacts to on Base transportation systems would result as more people would likely use the new facility more often. However, this increase would be considered less than significant.

Construction of a CAC at this site is consistent with the General Plan. New development would be designed and constructed to be architecturally consistent and compatible with existing facilities and structures. Landscaping for the proposed CAC would be provided using standards identified in the General Plan.

4.8.2 Alternatives 3 and 4

Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.8.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur, therefore, no impacts to land use, transportation or visual resources would occur.

4.9 Socioeconomics and Environmental Justice

This section considers the potential socioeconomic and environmental justice impacts of implementing on of the alternatives. Minority populations, poverty status, and age characteristics of populations in Cascade County were analyzed by evaluating the data presented in Section 3.9. With regard to environmental justice and protection of children,

Malmstrom AFB and County data was compared to regional, state, and national demographics to evaluate whether proportional differences exist.

Comparison of the data set forth in Section 3.9 does not indicate any areas of concern with respect to minority populations, low-income populations, or youth populations. Malmstrom AFB has a higher concentration of minority populations than Cascade County or the State of Montana.

The proposed CAC would enhance the quality of life for residents of the Base. The effects and impact of the demolition of the Club and construction of the proposed CAC is short term and would not expose on Base or off Base minority or low income populations to disproportionately high or adverse human health or environmental effects.

No long-term changes in Base employment or expenditures are anticipated as a result of the construction of the CAC. Construction activities would provide a temporary, relatively minor beneficial economic impact to businesses located in the county. Negligible off Base socioeconomic or environmental justice benefits could be expected.

Construction-related noise impacts would occur outside of residential areas. As discussed in Section 4.6, noise impacts are anticipated to be temporary and minor.

4.9.1 Alternatives 1 and 2

Construction activities associated with the implementation of either of the alternatives would temporarily generate construction jobs and income. No permanent or long-lasting socioeconomic impacts are anticipated as a result of implementation of either of the alternatives.

Operational impacts associated with the CAC would be beneficial. The CAC would be used by Base personnel for activities that would improve the quality of life on Base. Refer to Section 1.3 for a description of activities that would be held at the proposed CAC.

4.9.2 Alternatives 3 and 4

Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.9.3 No Action Alternative

Under the No Action Alternative, construction of the CAC and demolition of the Club would not occur, and no impacts to socioeconomic or environmental justice would occur.

4.10 Utilities

This section discusses potential impacts to utilities, such as water, wastewater, energy, and communication resources.

4.10.1 Alternatives 1 and 2

Site 1 is located in an area of the Base that has existing utility infrastructure. All existing utilities are underground, including electrical, fire protection, natural gas, HVAC, water, sewer, telephone, and cable television. Telephone and electrical services, originally installed

above ground, were buried during renovations of the on Base utility systems. Standard construction practices for locating buried utilities would be implemented prior to ground-disturbing activities to avoid or minimize impacts to buried utilities at Site 1.

Malmstrom AFB has a water supply distribution system, sanitary sewage system, electrical supply, natural gas supply and distribution system, and central heating system that adequately meet the demands of the installation. The utility infrastructure at Malmstrom AFB has adequate capacity to support growth on the installation, and adequate utility capacity to meet the demands of the CAC. Therefore no long-term impact to utilities would result at Site 1.

4.10.2 Alternatives 3 and 4

Impacts would be the same as described for implementation of Alternatives 1 and 2.

4.10.3 No Action Alternative

Under the No Action Alternative, construction of the CAC Facility and demolition of the existing Club would not occur; therefore, no impacts to utilities would occur.

4.11 Best Management Practices Summary

Table 4-2 summarizes the best management practices listed in this section.

TABLE 4-2
Summary of Best Management Practices
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Resource Area	Best Management Practices
Air Quality	Construction: Control fugitive dust emissions in accordance with standard construction practices, such as frequent spraying of water on exposed soil, proper soil stockpiling methods, and prompt replacement of groundcover or pavement. Use efficient grading practices. Avoid long periods with engines idling.
Water Resources	Implement Annex P, Malmstrom AFB Storm Water Pollution Prevention Plan to avoid or minimize erosion and inadvertent spills.
	Obtain and adhere to requirements stipulated in a General Permit for Storm Water Discharges Associated with Construction Activity
Soils	Implementation of standard engineering design and construction practices.
	Landscape exposed areas upon construction in accordance with Malmstrom AFB landscaping standards listed in the Malmstrom AFB Facilities Excellence Plan (Malmstrom AFB, 2002b).
Cultural Resources	If archaeological resources are encountered during construction, halt work and implement Section 106 of the NHPA, including NRHP evaluation of all identified resources.
Health, Safety, and Waste Management	Conduct asbestos and lead-based paint surveys prior to demolition of the Club.
	Follow safety management requirements as specified in the construction contract.
	Dispose of hazardous and solid waste in accordance with state and federal regulations and the HWMP and SWMP procedures.
	Implementation of Alternative 4 might require coordination with MDEQ prior to construction at Site 2.
Land Use (Visual Resources)	Design the CAC to meet Air Force standards and to be visually consistent with current and proposed Malmstrom AFB building design.

TABLE 4-2
Summary of Best Management Practices
Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana

Resource Area	Best Management Practices
Utilities	Implement standard construction practices for locating buried utilities.

SECTION 5.0

Cumulative Effects and Irreversible and Irretrievable Commitment of Resources

5.1 Cumulative Effects

This section provides a definition of cumulative effects; a description of past, present, and reasonably foreseeable actions relevant to cumulative effects; and an evaluation of cumulative effects potentially resulting from these interactions. As summarized in Table 2-2, potential impacts resulting from construction of a CAC and demolition of the existing Club to any of the resource areas evaluated are considered to be less than significant.

5.1.1 Definition of Cumulative Effects

CEQ regulations stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in considering cumulative effects affirms this requirement, stating that the first steps in assessing cumulative effects involve defining the scope of the other actions and their interrelationship with the proposed action. The scope must consider geographic and temporal overlaps among the proposed action and other actions. It must also evaluate the nature of interactions among these actions.

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. For the purpose of this discussion, the proposed action is defined as implementation of any of the Alternatives 1 through 4 because each alternative includes construction of a CAC, and demolition of the Club. Because the alternatives are similar in scope and environmental impacts for all resource areas except water resources, they may be summarily compared to other past, present, and future actions for an evaluation of cumulative effects. Actions overlapping with, or in close proximity to, the proposed action would be expected to have greater potential for a relationship than actions that are geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify cumulative effects, this EA addresses the following three questions:

1. Does a relationship exist such that elements of the proposed action might interact with elements of past, present, or reasonably foreseeable actions?

2. If one or more of the elements of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?

3. If such a relationship exists, does an assessment reveal any potentially adverse impacts not identified when the proposed action is considered alone?

In this EA, an effort has been made to identify all related actions under consideration or in the planning phase at this time. To the extent that details regarding such actions exist and the actions have a potential to interact with the proposed action in this EA, these actions are included in this cumulative analysis. This combined approach enables stakeholders to have the most current information available so that environmental consequences of the proposed action can be evaluated.

Projects considered for cumulative impacts in this EA are those that have recently been implemented, are ongoing, or are planned to begin within the reasonably foreseeable future at Malmstrom AFB. Projects being considered that do not have sufficient information available are considered too uncertain and are not evaluated.

5.1.2 Past, Present, and Reasonably Foreseeable Actions

This EA applies a stepped approach to provide stakeholders with the cumulative effects of the proposed action and the incremental contribution of past, present, and reasonably foreseeable actions.

5.1.2.1 Past, Present, and Reasonably Foreseeable Future Actions Relevant to the Proposed Action

Malmstrom AFB is an active military installation that undergoes continuous change in mission and training requirements. This process of change is consistent with the United States defense policy that the USAF must be ready to respond to threats to American interests throughout the world. The most recent mission change at Malmstrom AFB was in 1997 when the 819th Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer (RED HORSE) was assigned to Malmstrom AFB. Malmstrom AFB prepared an EA for the 819th RED HORSE 5-year plan at the Base.

DoD released a Base Realignment and Closure (BRAC) list on May 16, 2005. The BRAC process has slated Malmstrom AFB to gain a U.S. Army Reserve Center with a proposed 9-acre site on the southeast side of the Base. It is anticipated that the proposed site would drain to the south and stormwater would exit on the southeast side of the runway (Lucas, 2006d). This proposed action is still in the conceptual phase and sufficient information is not available to add assessment of this future action into this cumulative effects analysis.

To maintain functional capacity, Malmstrom AFB needs new construction, facility improvements, and infrastructure upgrades. The following projects were completed by the Base during the last 5 years:

- Corrosion control facility upgrade. The Installation Commander signed a FONSI for the corrosion control facility upgrade, which was recently completed.
- Heating plant upgrade. The recent heat plant upgrade has been categorically excluded from requiring an EA because the purpose of the project is maintenance.
- Phase I of the housing project upgrade (5 years ago).

- Stormwater detention basin near Outfall 1. The outfall was specifically designed to reduce the stormwater runoff associated with peak flow events discharging from Drainage Basin 1 into Whitmore Ravine.

The following facility improvement projects are either complete, are currently being implemented or will be constructed in the near-term at Malmstrom AFB:

- Phases IV through VII housing project upgrade
- Construction of a fitness center
- Construction of a new storm water retention/detention pond at storm water Outfall 3 in Drainage Area 3 has been completed with the exception of re-vegetation

Construction of the RED HORSE administrative facility has been completed at Malmstrom AFB. The facility is approximately 7,500 square feet and includes a parachute drying tower (approximately 400 square feet) in the watershed leading to the east branch of Whitmore Ravine.

No future projects, other than construction of the CAC, are proposed for either Site 1 or 2 or other locations in the watershed leading to the west branch of Whitmore Ravine. The scope of other proposed actions currently listed in the MILCON program is too speculative to evaluate. The USAF anticipates a continuing mission for Malmstrom AFB, but the specific nature of that mission and the military units stationed at Malmstrom AFB to undertake that mission are subject to change within the discretion of the U.S. Congress and the Executive Branch.

5.1.3 Analysis of Cumulative Impacts

Under the No Action Alternative, construction of the CAC and demolition of the existing Club would not occur and no cumulative impacts would occur. Therefore, no further evaluation of the No Action Alternative is included here. The following analysis examines whether impacts resulting from implementation of any of the alternatives might result in cumulative impacts when considered with past, present, and reasonably foreseeable future actions (projects).

5.1.3.1 Air Resources

Because of the nature of the development activities, it is expected that construction impacts to air quality would be short-term and limited to localized areas. Prolonged construction activity, such as the Malmstrom AFB housing replacement program and the construction and demolition of the fitness center, could conceivably impact regional air quality attainment status. However, it is unlikely that implementation of any of the alternatives, in addition to current actions, would result in long-term air quality degradation. Implementation of the alternatives would not result in a significant cumulative effect on air resources.

5.1.3.2 Water Resources

Potential cumulative impacts to stormwater resources could occur with implementation of the alternatives.

Drainage Areas 1 and 2 discharge into the west fork of Whitmore Ravine. Analyses of impacts to Whitmore Ravine from previously planned projects concluded the following:

- As evaluated in the multi-family housing Phase 6 and 7 EA (Malmstrom AFB, 2005a), Housing Phases 1, 2, 3, and 4 created a maximum storm water increase of 3.5 percent in the west fork of Whitmore Ravine during peak flow events. Subsequent designs have incorporated onsite detention of the 10yr/2hr storm event within phases 7C and 7D family housing areas. This project contributes to cumulative impacts associated with increases in stormwater runoff.
- Decreases in impervious area (1.44 acres) during Phase 6 would be offset by increases in paved areas of approximately similar size in Phase 7, resulting in a zero net change to Outfall 1 (Malmstrom AFB, 2005b). Therefore, this project would not contribute to cumulative impacts.
- The combined past actions of Phase 5 housing and fitness center replacement projects would increase the impervious surface in Storm Water Drainage Area 2 by 3.44 acres (Malmstrom AFB, 2006d), resulting in adverse impacts to stormwater quality or quantity.
- The Corrosion Control Facility upgrade adds approximately 1 acre of impervious surface area to Drainage Area 3 which discharges to the middle fork of Whitmore Ravine. This project contributes to cumulative impacts associated with increases in stormwater runoff.
- The heat plant upgrade would not contribute to cumulative impacts because it is a maintenance project, resulting in no increase in impervious surface area draining to Whitmore Ravine.
- The Base designed and constructed detention and storm drain outfall systems to better manage surface water runoff during peak flow events in Drainage Area 1. This project resulted in a beneficial impact to stormwater quality and quantity.
- Construction of RED HORSE facilities in the watershed leading to the east fork of Whitmore Ravine could result in potentially adverse impacts to stormwater quality or quantity. Malmstrom AFB will evaluate whether implementation of LID would reduce adverse impacts.
- The constructed stormwater retention/detention pond at Outfall 3 in Drainage Area 3 will improve stormwater management during peak flow events in Drainage Area 3 and thus reduce impacts associated with runoff from large storm events (i.e., 24-hour, 10-year storms) to Whitmore Ravine.

Increased stormwater runoff from larger storm events would result from an increase in impervious surface area with implementation of any of the alternatives for construction of the CAC prior to Club demolition. Implementation of LID measures would consist of detention and/or other means that would capture and detain either 80 percent of stormwater generated during a 2-year, 24-hour storm event (Alternative 4) or all of the stormwater generated during the 2, 5 and 10-year, 2- to 24-hour storm events (Alternative 2). The implementation of LID measures would reduce additional runoff. This would

reduce potentially associated adverse impacts to downstream water resources, such as any increase in the rate of erosion of Whitmore Ravine and commensurate increases in sedimentation in the Missouri River, to negligible levels.

Cumulatively, the projects would result in an increase in stormwater runoff from Drainage Areas 1 and 2 into the west fork of Whitmore Ravine, primarily from construction of the fitness center and Phases 1 through 5 of the multi-family housing project. The stormwater system upgrade proposed for Drainage Area 3 would reduce impacts associated with large storms. The proposed action to construct a CAC with LID would result in only negligible flow of stormwater to Whitmore Ravine and, therefore, the contribution of the CAC to cumulative impacts to Whitmore Ravine resulting from stormwater runoff are considered to be less than significant.

Considering implementation of past, present, and future actions cumulatively, they should alter neither the drainage pattern nor the course of Whitmore Ravine; they should neither increase flooding nor are they anticipated to exceed the capacity of the existing stormwater drainage system; they should not generate an increase in polluted runoff. Therefore, potentially adverse cumulative stormwater impacts, including those to Whitmore Ravine, are considered to be less than significant.

5.1.3.3 Geological Resources

Permanent changes to soil structure and stability could occur by disrupting and reworking certain soils. However, none of the projects geologically overlap. The limited scope of these cumulative actions in a finite area does not combine to create significant geological environmental impacts when considered individually or cumulatively.

5.1.3.4 Biological Resources

Permanent changes to biological resources would occur by removing landscaping or natural habitat and replacing it with paved or built areas. However, neither endangered species nor their habitat would be affected and the impacts do not combine to create significant biological impacts when considered cumulatively.

5.1.3.5 Cultural Resources

Permanent impacts to cultural could occur during construction. To date, no traditional resources have been identified within Malmstrom AFB. In the event that archaeological resources are encountered during construction, compliance with Section 106 of the NHPA would be necessary prior to completing construction and, therefore, significant cumulative impacts are not anticipated.

5.1.3.6 Noise

Post-construction noise impacts from implementation of any of the alternatives would increase slightly over the current impacts at the existing Club and would be considered consistent with other nearby and established uses. Therefore, no significant cumulative noise impacts would result.

5.1.3.7 Health, Safety, and Waste Management

Permanent impacts to health and safety could occur during construction or operation of the projects. Permanent impacts could result from inappropriate handing, storage, or disposal

of waste. Compliance with applicable regulations protecting human health and regulating waste management as well as implementation of best management practices during construction and operation would reduce potential cumulative impacts to less than significant levels.

5.1.3.8 Land Use, Transportation and Visual Resources

Considered individually, none of the past, present, or foreseeable actions identified any long-term transportation impact because none of the actions would increase the active duty population or require an increase in mission-related on Base travel. Therefore, significant cumulative impacts would not occur. Land use would be consistent with the Base General Plan and construction projects would be consistent with current and proposed design standards and, therefore, no significant cumulative impacts would result.

5.1.3.9 Socioeconomics and Environmental Justice

Construction activities associated with the projects would temporarily generate construction jobs and impacts and thus result in a temporary beneficial impact. Neither construction nor operation of the projects would disproportionately affect minority or economically disadvantaged populations.

5.1.3.10 Utilities

The utility infrastructure at Malmstrom AFB has adequate capacity to accommodate the projects and, therefore, no significant cumulative impacts to utilities would result.

5.2 Irreversible and Irretrievable Commitment of Resources

NEPA recommends that environmental analysis include identification of " . . . any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the demolition of a historical building).

For the proposed project alternatives, most resource commitments are neither irreversible nor irretrievable. When evaluating a non-industrial endeavor such as the proposed alternatives in the context of development in an urban setting, most environmental consequences are short term and temporary (such as air emissions and noise from construction activities) or longer lasting but negligible.

The design team will specify, as required by the USAF Procurement Regulations, that sustainable materials be used throughout the construction of the proposed action. For example, the existing pavements and facility concrete shall be recovered, crushed, and reused as appropriate on future projects.

Those limited resources that could involve a possible irreversible or irretrievable commitment under the proposed action include consumption of limited amounts of

materials typically associated with facility construction (e.g., concrete, finish materials, doors, windows wiring, plumbing, insulation, and HVAC). The amount of these materials used is expected to minimally decrease the availability of the consumed resources locally or globally. Implementation of the Proposed Action would not result in impacts to any natural resources that are considered unique or exceptional.

5.3 Conclusions

Based on the analysis of the proposed alternatives, it is concluded that, Alternative 2: construction of the CAC with LID and demolition of the existing Club would best satisfy the projects purpose and need and result in the least amount of environmental impacts. Malmstrom AFB selects Alternative 2, Construct CAC at Site 1 Including LID, as the Preferred Alternative, because its implementation would not result in significant impact to the environment and because Site 1 is larger than Site 2, and it provides more area to accommodate LID.

SECTION 6.0

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Appendix A
Interagency Letters

APPENDIX A

Interagency Letters

To be provided in the *Final Environmental Assessment for Constructing a Community Activity Center, Malmstrom Air Force Base, Montana*.

Appendix B
Photographic Documentation

APPENDIX B

Photographic Documentation

Looking northwest toward Site 1 from the southern corner of the Goddard Drive and Avenue C intersection. Alternatives 1 and 2 are proposed in the open green space in the foreground of this location.

Looking southwest toward Site 2 from the northern corner of the intersection of 74th Street North and 4th Avenue North. Alternatives 3 and 4 are proposed in the open green space in the foreground of this location.

Looking north toward the Drainage Area 2 outfall, south of the northern boundary of the Base, east of the intersection of Walnut Street and Perimeter Road.

Looking north toward the Drainage Area 1 outfall, south of the northern boundary of the Base, east of Rainbow Dam Road.

Appendix C
Acronyms and Abbreviations

APPENDIX C

Acronyms and Abbreviations

F	degrees Fahrenheit
$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AFB or Base	Air Force Base
AICUZ	Air Installation Compatible Use Zone
AQCR	Air Quality Control Region
ARM	Administrative Rules of Montana
bgs	below ground surface
BRAC	Base Realignment and Closure
CAA	Clean Air Act
CAC	community activity center
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
341 CES	341st Civil Engineer Squadron
341 CES/CEV	Environmental Flight
CFR	Code of Federal Regulations
dB	decibel
dBA	A-weighted decibel
DoD	Department of Defense
EA	environmental assessment
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ft^2	square feet
H_2S	hydrogen sulfide
NHP	Natural Heritage Program
HVAC	heating, ventilation, and air conditioning

HWMP	hazardous waste management plan
IRP	Installation Restoration Program
L_{dn}	day/night average sound level
L_{eq}	energy-equivalent sound
LID	low-impact development
m^2	square meters
MCA	Montana Code Annotated
MDEQ	Montana Department of Environmental Quality
MPDES	Montana Pollutant Discharge Elimination System
NAAQS	National Ambient Air Quality Standards
NCP	National Contingency Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act of 1966
NO_2	nitrogen dioxide
NPL	National Priorities List
NRHP	National Register of Historic Places
O_3	ozone
OSHA	Occupational Safety and Health Administration
Pb	lead
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PSD	prevention of significant deterioration
RCRA	Resource Conservation and Recovery Act
RED HORSE	Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer
ROI	region of influence
SARA	Superfund Amendments and Reauthorization Act
SO_2	sulfur dioxide
SWMP	solid waste management plan

2262	TSP	settleable particulates
2263	USAF	United States Air Force
2264	USC	United States Code
2265	USFWS	U.S. Fish and Wildlife Service
2266	VOC	volatile organic compound

Appendix D
Draft Final Whitmore Ravine Watershed Assessment, Upper Missouri Dearborn Rivers Sub-Basin, Sub-Unit

APPENDIX D

Draft Final Whitmore Ravine Watershed Assessment, Upper Missouri Dearborn Rivers Sub-Basin, Sub-Unit